SUZUKI

GZ125

SERVICE MANUAL

99500-31090-01E

99500-31090-01E

9/04

FOREWORD

This manual contains an introductory description on the SUZUKI GZ125 and procedures for its inspection/service and overhaul of its main components. Other information considered as generally known is not included.
Read the GENERAL INFORMATION section to familiarize yourself with the motorcycle and its maintenance. Use this section as well as other sections as a guide for proper inspection and service.
This manual will help you know the motorcycle better so that you can assure your customers of fast and reliable service.

- ** This manual has been prepared on the basis of the latest specifications at the time of publication. If modifications have been made since then, differences may exist between the content of this manual and the actual motorcycle.*
- ** Illustrations in this manual are used to show the basic principles of operation and work procedures. They may not represent the actual motorcycle exactly in detail.*
- ** This manual is written for persons who have enough knowledge, skills and tools, including special tools, for servicing SUZUKI motorcycles. If you do not have the proper knowledge and tools, ask your authorized SUZUKI motorcycle dealer to help you.*

⚠WARNING

Inexperienced mechanics or mechanics without the proper tools and equipment may not be able to properly perform the service described in this manual. Improper repair may result in injury to the mechanic and may render the motorcycle unsafe for the rider and passenger.

SUZUKI MOTOR CORPORATION
Motorcycle Service Department

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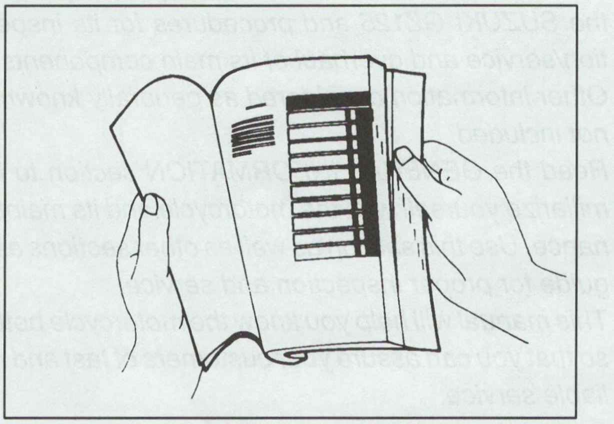
HOW TO USE THIS MANUAL

TO LOCATE WHAT YOU ARE LOOKING FOR:

1. The text of this manual is divided into sections.
2. The section titles are listed in the GROUP INDEX.
3. Holding the manual as shown at the right will allow you to find the first page of the section easily.
4. The contents are listed on the first page of each section to help you find the item and page you need.



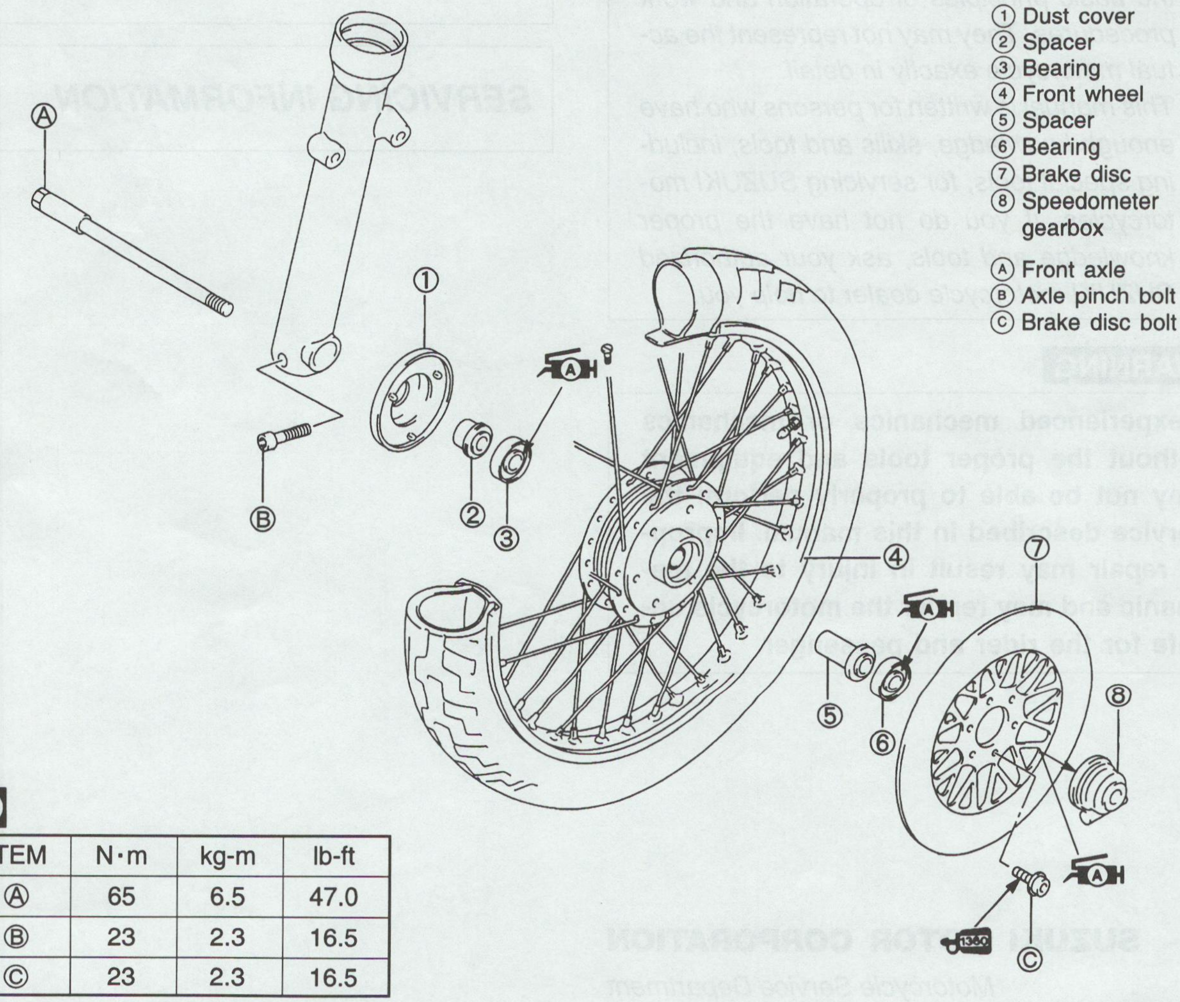
COMPONENT PARTS AND WORK TO BE DONE

Under the name of each system or unit, is its exploded view. Work instructions and other service information such as the tightening torque, lubricating points and locking agent points, are provided.

Example: Front wheel

① Dust cover
② Spacer
③ Bearing
④ Front wheel
⑤ Spacer
⑥ Bearing
⑦ Brake disc
⑧ Speedometer gearbox

Ⓐ Front axle
Ⓑ Axle pinch bolt
Ⓒ Brake disc bolt



ITEM	N·m	kg-m	lb-ft
Ⓐ	65	6.5	47.0
Ⓑ	23	2.3	16.5
Ⓒ	23	2.3	16.5

SYMBOL

Listed in the table below are the symbols indicating instructions and other information necessary for servicing. The meaning of each symbol is also included in the table.

SYMBOL	DEFINITION	SYMBOL	DEFINITION
🔧	Torque control required. Data beside it indicates specified torque.	BF	Apply or use brake fluid.
OIL	Apply oil. Use engine oil unless otherwise specified.	V	Measure in voltage range.
A	Apply SUZUKI SUPER GREASE "A". 99000-25010	Ω	Measure in resistance range.
S	Apply SUZUKI SILICONE GREASE. 99000-25100	A	Measure in current range.
M	Apply SUZUKI MOLY PASTE. 99000-25140	⊣◀	Measure in diode test range.
1215	Apply SUZUKI BOND "1215". 99000-31110	•)))	Measure in continuity test range.
1303	Apply THREAD LOCK SUPER "1303". 99000-32030	TOOL	Use special tool.
1342	Apply THREAD LOCK "1342". 99000-32050	FORK	Use fork oil. 99000-99001-SS8
1360	Apply THREAD LOCK "1360". 99000-32130		

GENERAL INFORMATION

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WARNING/CAUTION/NOTE

Please read this manual and follow its instructions carefully. To emphasize special information, the symbol and the words WARNING, CAUTION and NOTE have special meanings. Pay special attention to the messages highlighted by these signal words.

⚠ WARNING

Indicates a potential hazard that could result in death or injury.

⚠ CAUTION

Indicates a potential hazard that could result in motorcycle damage.

NOTE:
Indicates special information to make maintenance easier or instructions clearer.

Please note, however, that the warnings and cautions contained in this manual cannot possibly cover all potential hazards relating to the servicing, or lack of servicing, of the motorcycle. In addition to the WARNINGS and CAUTIONS stated, you must use good judgement and basic mechanical safety principles. If you are unsure about how to perform a particular service operation, ask a more experienced mechanic for advice.

GENERAL PRECAUTIONS

⚠ WARNING

- **Proper service and repair procedures are important for the safety of the service mechanic and the safety and reliability of the motorcycle.**
- **When 2 or more persons work together, pay attention to the safety of each other.**
- **When it is necessary to run the engine indoors, make sure that exhaust gas is forced outdoors.**
- **When working with toxic or flammable materials, make sure that the area you work in is well ventilated and that you follow all of the manufacturer's instructions.**
- **Never use gasoline as a cleaning solvent.**
- **To avoid getting burned, do not touch the engine, engine oil and exhaust system until they have cooled.**
- **After servicing fuel, oil, exhaust or brake systems, check all of the lines and fittings related to the system for leaks.**

⚠ CAUTION

- * If parts replacement is necessary, replace the parts with Suzuki Genuine Parts or their equivalent.
- * When removing parts that are to be reused, keep them arranged in an orderly manner so that they may be reinstalled in the proper order.
- * Be sure to use special tools when instructed.
- * Make sure that all parts used in reassembly are clean. Lubricate them when specified.
- * Use the specified lubricant, bond, or sealant.
- * When removing the battery, disconnect the negative cable first and then the positive cable.
- * When reconnecting the battery, connect the positive cable first and then the negative cable, and cover the positive terminal with the terminal cover.
- * When performing service to electrical parts, disconnect the battery negative cable unless the service procedure requires the battery power.
- * When tightening cylinder head and crankcase bolts and nuts, tighten the larger sizes first. Always tighten the bolts and nuts from the inside working out, in a crisscross pattern and to the specified tightening torque.
- * Whenever you remove oil seals, gaskets, packing, O-rings, self-locking nuts, locking washers, cotter pins, circlips, and certain other parts as specified, be sure to replace them with new ones. Also, before installing these new parts, be sure to remove any left over material from the mating surfaces.
- * Never reuse a circlip. When installing a new circlip, take care not to expand the end gap larger than required to slip the circlip over the shaft. After installing a circlip, always ensure that it is completely seated in its groove and securely fitted.
- * Use a torque wrench to tighten fasteners to the specified torque. Wipe off grease and oil if a thread is smeared with them.
- * After reassembling, check parts for tightness and proper operation.

- * To protect the environment, do not unlawfully dispose of used motor oil and all other fluids, batteries, and tires.
- * To protect the earth's natural resouces, properly dispose of used motorcycles and parts.

SUZUKI GZ125W ('98-MODEL)

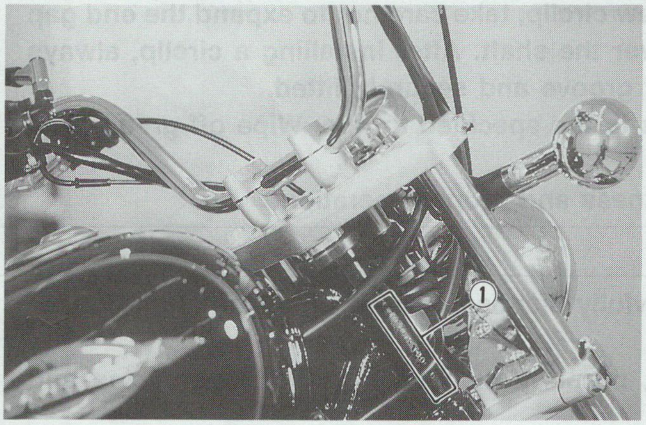
RIGHT SIDE

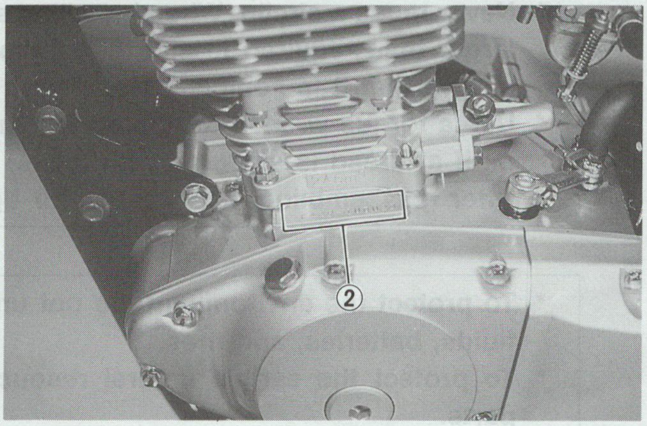
LEFT SIDE

* Difference between photographs and the actual motorcycles depends on the markets.

SERIAL NUMBER LOCATION

The frame serial number or V.I.N. (Vehicle Identification Number) ① is stamped on the right side of the steering head pipe. The engine serial number ② is located on the left side of the crankcase. These numbers are required especially for registering the machine and ordering spare parts.





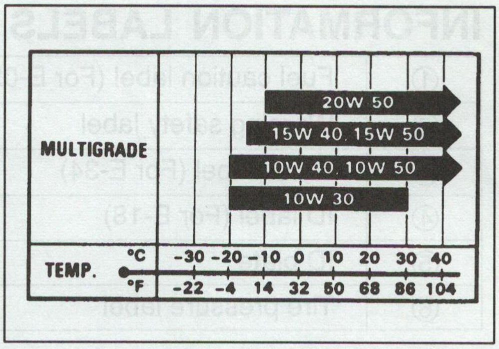
FUEL AND OIL RECOMMENDATIONS

FUEL

Use unleaded gasoline that is graded 85–95 octane or higher.

ENGINE OIL

Use only oils which are rated SF or SG under the API classification. The recommended viscosity is SAE 10W/40. If SAE 10W/40 engine oil is not available, select an alternative according to the chart.



BRAKE FLUID

BF **Specification and classification: DOT 4**

⚠ WARNING

> **This motorcycle is uses a glycol-based brake fluid. Do not use or mix different types of brake fluid such as silicone-based and petroleum-based fluids for refilling the system, otherwise serious damage will result to the brake system.**
> **Never use any brake fluid taken from old, used or unsealed containers.**
> **Never re-use brake fluid left over from a last servicing or which has been stored for a long period of time.**

FRONT FORK OIL

Use SUZUKI fork oil SS-08 (#10).

BREAK-IN PROCEDURES

During manufacturing only the best possible materials are used and all machined parts are finished to a very high standard. It is still necessary to allow the moving parts to "BREAK-IN" before subjecting the engine to maximum stresses. The future performance and reliability of the engine depends on the care and restraint exercised during its early life. The general rules are as follows.

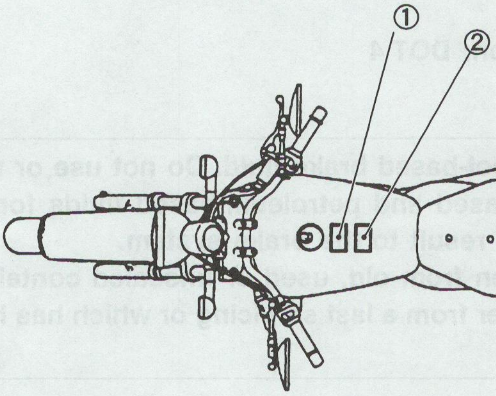
- Keep to this break-in throttle position.

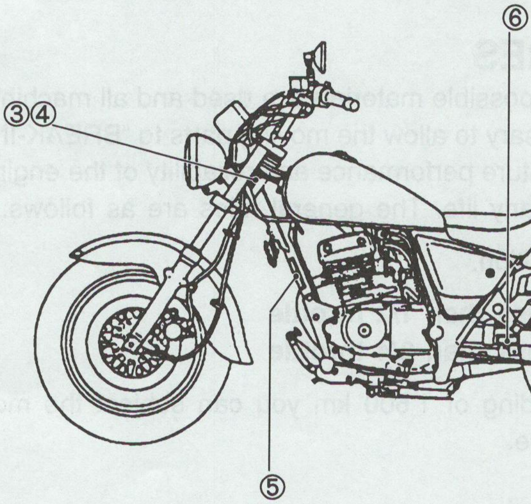
Initial 800 km (500 miles) : Less than 1/2 throttle
Up to 1 600 km (1 000 miles) : Less than 3/4 throttle

- Upon reaching an odometer reading of 1 600 km you can subject the motorcycle to full throttle operation for short periods of time.

INFORMATION LABELS

①	Fuel caution label (For E-02)
②	Warning safety label
③	Noise label (For E-34)
④	ID label (For E-18)
⑤	ID plate
⑥	Tire pressure label





SPECIFICATIONS

DIMENSIONS AND DRY MASS

Overall length	2 160 mm (85.0 in)
Overall width	815 mm (32.1 in)
Overall height	1 090 mm (42.9 in)
Wheelbase	1 450 mm (57.1 in)
Ground clearance	140 mm (5.5 in)
Seat height	680 mm (27.8 in)
Dry mass	125 kg (275 lbs)

ENGINE

Type	Four-stroke, air-cooled, OHC
Number of cylinder	1
Bore	57.0 mm (2.244 in)
Stroke	48.8 mm (1.921 in)
Displacement	124 cm^3 (7.6 cu. in)
Compression ratio	9.5 : 1
Carburetor	MIKUNI BS26SS, single
Air cleaner	Non-woven fabric element
Starter system	Electric
Lubrication system	Wet sump

TRANSMISSION

Clutch	Wet multi-plate type
Transmission	5-speed constant mesh
Gearshift pattern	1-down, 4-up
Primary reduction ratio	3.470 (59/17)
Secondary reduction ratio	3.000 (45/15)
Gear ratios, Low	3.000 (33/11)
2nd	1.857 (26/14)
3rd	1.368 (26/19)
4th	1.095 (23/21)
Top	0.913 (21/23)
Drive chain	RK428FDZ, 132 links

ELECTRICAL

Ignition type	Electronic ignition (Transistorized)
Ignition timing	13° B.T.D.C. at 1 500 r/min
Spark plug	NGK DR8EA or DENSO X24ESR-U
Battery	12V 21.6 kC (6 Ah)/10 HR
Generator	Three-phase A.C. generator
Fuse	20A
Headlight	12V 60/55W
Position light	12V 4W
Brake light/Taillight	12V 21/5W
Turn signal light	12V 21W
Speedometer light	12V 1.7W
Neutral indicator light	12V 3.4W
Turn signal indicator light	12V 3.4W
High beam indicator light	12V 1.7W

CHASSIS

Front suspension	Telescopic, coil spring, oil damped
Rear suspension	Swingarm type, coil spring, oil damped, spring preload 5-way adjustable
Front fork stroke	120 mm (4.7 in)
Rear wheel travel	90 mm (3.5 in)
Steering angle	40° (right and left)
Caster	32° 30'
Trail	140 mm (5.5 in)
Turning radius	2.6 m (8.5 ft)
Front brake	Disc brake
Rear brake	Internal expanding
Front tire size	110/90-16 59P
Rear tire size	130/90-15M/C 66P

CAPACITIES

Fuel tank, including reserve		14 L (3.7/3.1 US/Imp gal)
	reserve	2.9 L (0.8/0.6 US/Imp gal)
Engine oil,	oil change	850 ml (0.90/0.75 US/Imp qt)
	with filter change	950 ml (1.00/0.84 US/Imp qt)
	overhaul	1 300 ml (1.37/1.14 US/Imp qt)
Front fork oil (each leg)		369 ml (12.5/13.0 US/Imp oz)

Specifications are subject to change without notice.

COUNTRY AND AREA CODES

The following codes stand for the applicable country(-ies) and area(-s).

CODE	COUNTRY OR AREA
E-01	General
E-02	UK
E-04	France
E-17	Sweden, Finland (E-15), Norway (E-16), Denmark (E-26)
E-18	Switzerland, Austria (E-39)
E-22	Germany
E-25	Netherlands
E-34	Italy, Belgium (E-21), Spain (E-53)

PERIODIC MAINTENANCE

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PERIODIC MAINTENANCE SCHEDULE

The chart below lists the recommended intervals for all the required periodic service work necessary to keep the motorcycle operating at peak performance and economy. Maintenance intervals are expressed in terms of kilometers and months, and are dependant on whichever comes first.

NOTE:
More frequent servicing may be performed on motorcycles that are used under severe conditions.

PERIODIC MAINTENANCE CHART

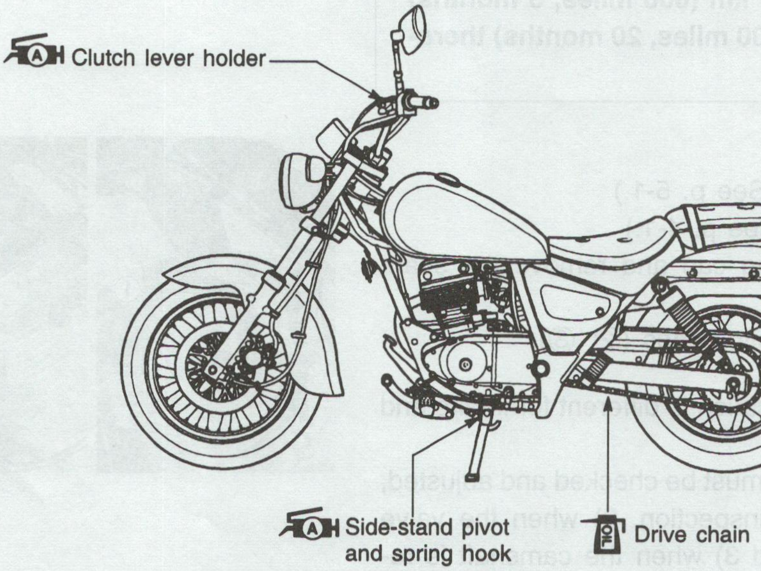
Interval	km	1 000	4 000	8 000
	mile	600	2 500	5 000
Item	months	5	20	40
Valve clearance		I	I	I
Spark plug		–	C	R
Air cleaner element		–	I	I
		Replace every 12 000 km (7 500 miles).		
Engine idle speed		I	I	I
Cam chain tension adjuster		I	I	I
Fuel hose		I	I	I
		Replace every 4 years.		
Clutch		I	I	I
Engine oil and engine oil filter		R	R	R
Drive chain		I	I	I
		Clean and lubricate every 1 000 km (600 miles).		
Brakes		I	I	I
Brake hose		I	I	I
		Replace every 4 years.		
Brake fluid		I	I	I
		Replace every 2 years.		
Steering		I	I	I
Front forks		–	I	I
Rear suspension		–	I	I
Tires		I	I	I
Exhaust pipe bolts and muffler mounting bolts		T	T	T
Chassis bolts and nuts		T	T	T

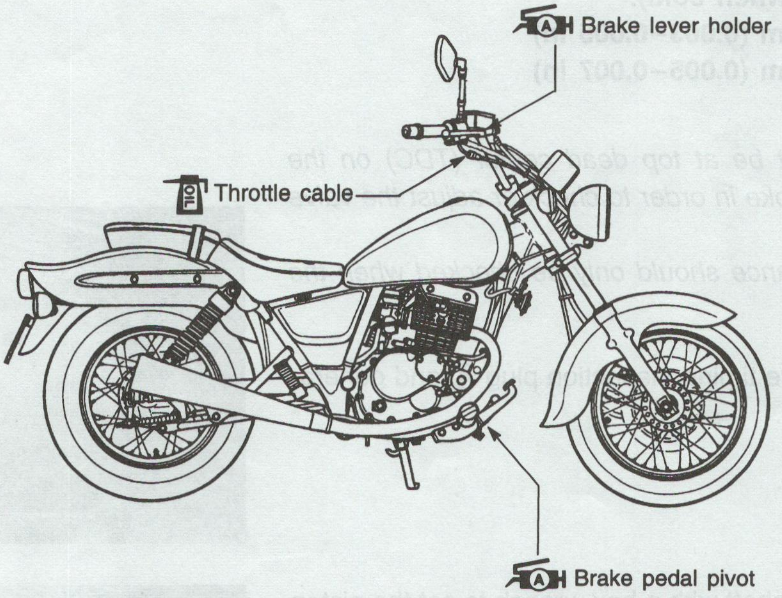
NOTE:
I: Inspection and adjust, clean, lubricate or replace as necessary
C: Clean R: Replace T: Tighten

LUBRICATION POINTS

Proper lubrication is important for smooth operation and long life of each working part of the motorcycle.

Major lubrication points are indicated below.


Clutch lever holder
Side-stand pivot and spring hook
Drive chain


Brake lever holder
Throttle cable
Brake pedal pivot

NOTE:

- ** Before lubricating each part, clean off any rusty spots and wipe off any grease, oil, dirt or grime.*
- ** Lubricate exposed parts which are subject to rust, with a rust preventative spray especially whenever the motorcycle has been operated under wet or rainy condition.*

MAINTENANCE AND TUNE-UP PROCEDURES

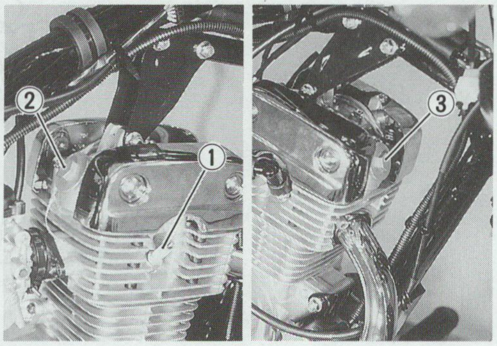
This section describes the servicing procedures for each item in the Periodic Maintenance chart.

VALVE CLEARANCE

Inspect initially at 1 000 km (600 miles, 5 months) and every 4 000 km (2 500 miles, 20 months) thereafter.

INSPECTION

- Remove the front seat. (See p. 5-1.)
- Remove the fuel tank. (See p. 4-1.)
- Disconnect the spark plug cap and remove the spark plug ①.
- Remove the valve inspection caps (②, ③).

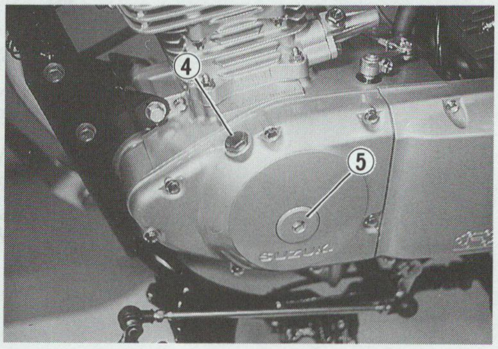


The valve clearance specification is different for intake and exhaust valves.
Valve clearance adjustment must be checked and adjusted, 1) at the time of periodic inspection, 2) when the valve mechanism is serviced, and 3) when the camshaft is removed for servicing.

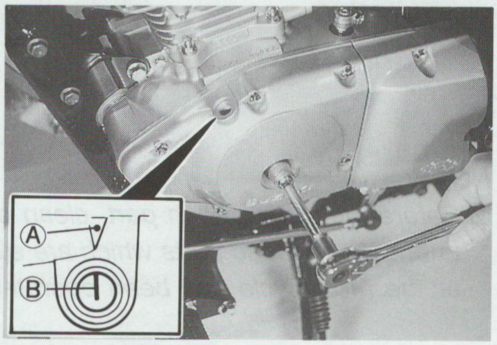
Valve clearance (when cold):
IN. : 0.08–0.13 mm (0.003–0.005 in)
EX.: 0.13–0.18 mm (0.005–0.007 in)

NOTE:
- * *The piston must be at top dead center (TDC) on the compression stroke in order to check or adjust the valve clearance.*
- * *The valve clearance should only be checked when the engine is cold.*

- Remove the valve timing inspection plug ④ and generator cover cap ⑤.



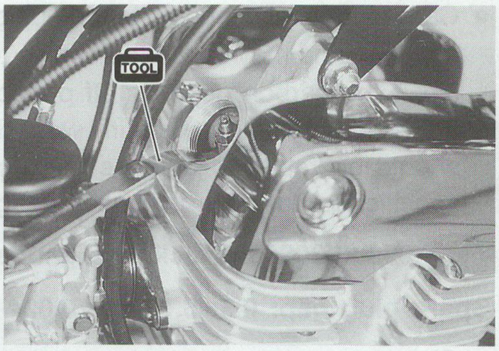
- Rotate the crankshaft with a box wrench to set the piston at top dead center (TDC) on the compression stroke. (Rotate the crankshaft until the line Ⓑ on the generator rotor is aligned with the triangle mark Ⓐ on the generator cover.)



- Insert a thickness gauge into the clearance between the valve stem end and the adjusting screw on the rocker arm.

TOOL **09900-20803: Thickness gauge**

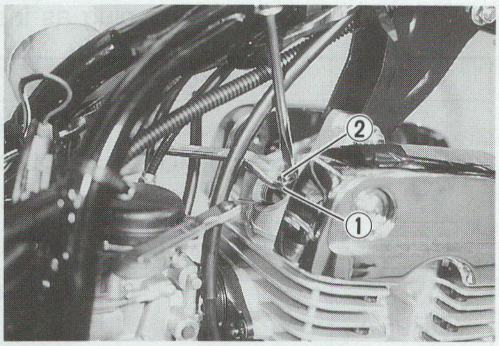
If the clearance is out of specification, adjust it to specification as follows.



ADJUSTMENT

The clearance is adjusted by using a screwdriver and offset wrench.

- Loosen the lock nut ①.
- Insert a thickness gauge into the clearance between the valve stem end and the adjusting screw on the rocker arm.
- Adjust the valve clearance by turning the adjusting screw ② while holding the lock nut ①.
- After the adjustment is completed, tighten the lock nut securely.
- Rotate the crankshaft 720° with a box wrench and check that the clearance is within specification.



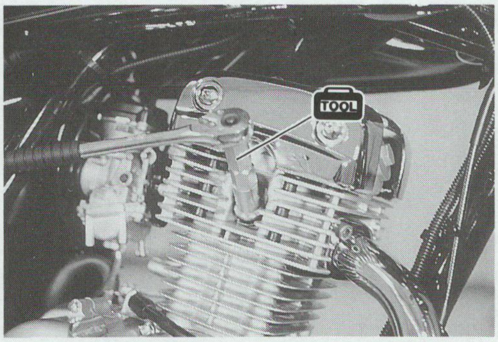
SPARK PLUG

Clean every 4 000 km (2 500 miles, 20 months).
Replace every 8 000 km (5 000 miles, 40 months).

Neglecting the spark plug eventually leads to difficult starting and poor engine performance. If the spark plug is used for a long period, the electrode gradually burns away and carbon builds up along the inside part of the spark plug. In accordance with the Periodic Maintenance chart, the spark plug should be inspected, cleaned and regapped at the recommended intervals.

- Disconnect the spark plug cap and remove the spark plug.

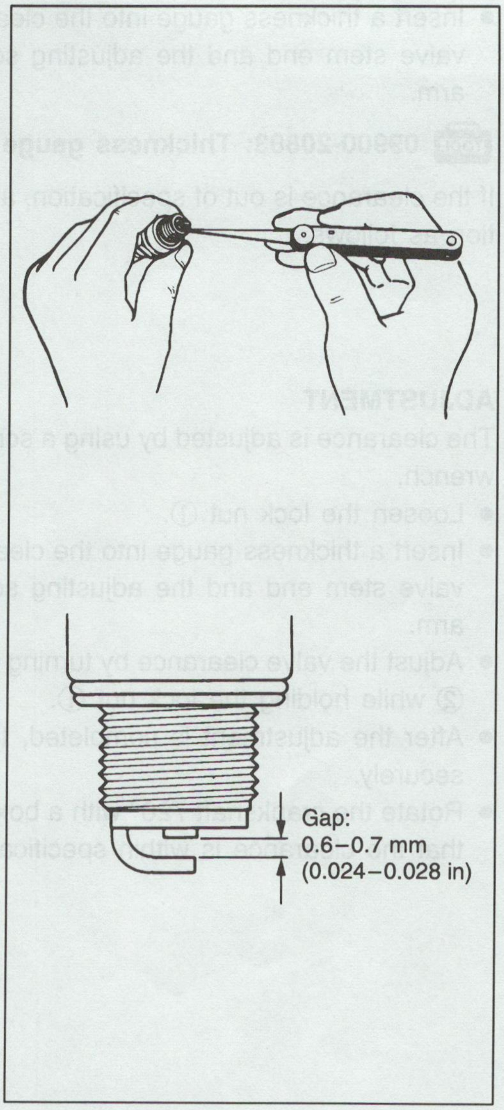
TOOL **09930-10121: Spark plug socket wrench set**



- Carbon deposits on the spark plug will prevent good sparking and may cause the engine to misfire. Be sure to clean the carbon deposits off periodically.
- If the center electrode is fairly worn down, the spark plug should be replaced and the spark plug gap set to the specification using a thickness gauge.

09900-20803: Thickness gauge

Spark plug gap: 0.6–0.7 mm (0.024–0.028 in)



- Check the spark plug for burns. If any abnormalities are found, replace the spark plug as indicated below.

NGK	DENSO	Remarks
DR7EA	X22ESR-U	If the standard spark plug is apt to get wet, replace with this plug.
DR8EA	X24ESR-U	Standard
DR9EA	X27ESR-U	If the standard spark plug is apt to overheat, replace with this plug.

⚠ CAUTION

Confirm the thread size and reach when replacing the spark plug. If the reach is too short, carbon will be deposited on the screw portion of the plug hole and engine damage may result.

⚠ CAUTION

Before using a spark plug wrench, carefully turn the spark plug by finger into the threads of the cylinder head to prevent damage.

- Tighten the spark plug to the specified torque using the special tool.

Spark plug: 18 N·m (1.8 kg-m, 13.0 lb-ft)

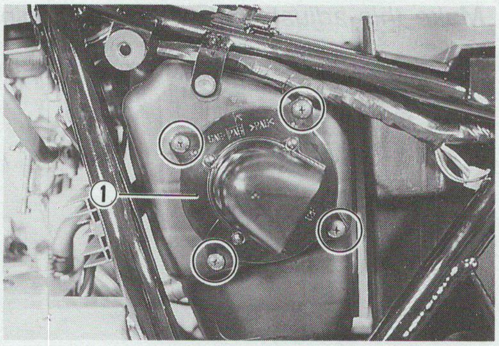
09930-10121: Spark plug socket wrench set

AIR CLEANER

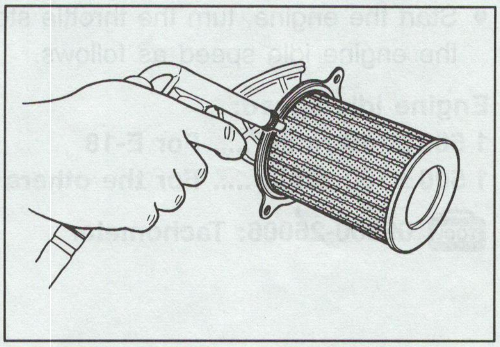
Inspect every 4 000 km (2 500 moles).
Replace every 12 000 km (7 500 miles).

If the air cleaner is clogged with dust, intake resistance will increase, resulting in a decrease in engine output and an increase in fuel consumption. Check and clean the air cleaner element in the following manner.

- Remove the front seat. (See p. 5-1.)
- Remove the left frame cover. (See p. 5-1.)
- Remove the air cleaner element ①.



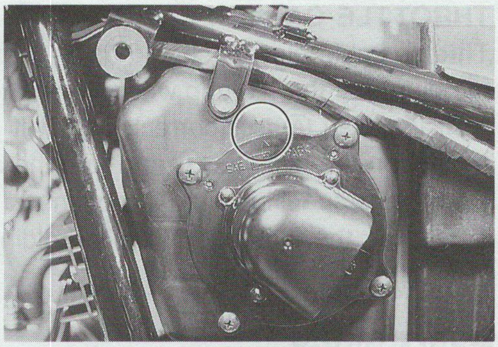
- Carefully use compressed air to clean the air cleaner element.



▲ CAUTION

Always apply compressed air to the outside of the air cleaner element. If compressed air is applied to the inside, dirt will be forced into the pores of the air cleaner element, restricting air flow through the air cleaner element.

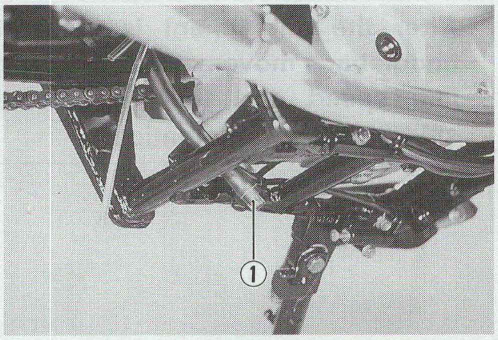
- Reinstall the cleaned or new air cleaner element in the reverse order of removal.
- When installing the air cleaner element into the air cleaner case, align the triangle marks on the air cleaner element and the air cleaner case.



▲ CAUTION

If driving under dusty conditions, clean the air cleaner element more frequently. The surest way to accelerate engine wear is to operate the engine without the element or to use a torn element. Make sure that the air cleaner is in good condition at all times. The life of the engine depends largely on this component!

NOTE:
When cleaning the air cleaner element, remove the plug ① and drain any water from the air cleaner drain hose.



CARBURETOR

Inspect initially at 1 000 km (600 miles, 5 months) and every 4 000 km (2 500 miles, 20 months) thereafter.

ENGINE IDLE SPEED

- Adjust the throttle cable play. (See p. 2-7.)
- Warm up the engine.

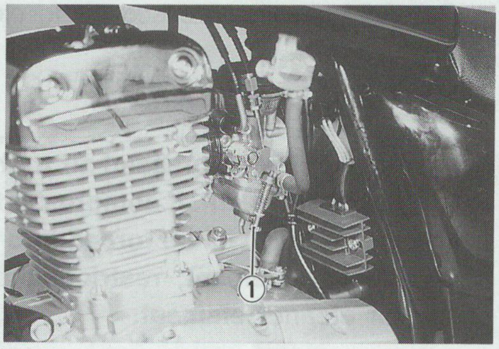
NOTE:
Make this adjustment when the engine is hot.

- Connect an electric tachometer to the high tension cord.

- Start the engine, turn the throttle stop screw ① and set the engine idle speed as follows.

Engine idle speed:
1 500 ± 50 r/min ..... For E-18
1 500 ± 100 r/min ..... For the others

TOOL 09900-26006: Tachometer

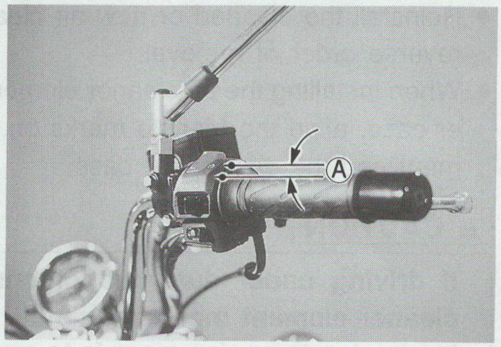


THROTTLE CABLE PLAY

Throttle cable play Ⓐ should be 3–6 mm (0.12–0.24 in) as measured at throttle grip when turning the throttle grip lightly. If the play Ⓐ is incorrect, adjust it as follows:

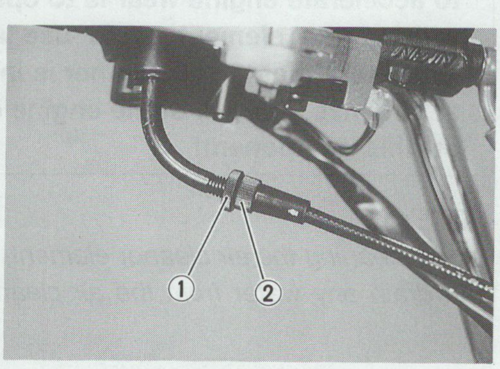
- Loosen the lock nut ① and turn the adjuster ② in or out until the specified play is obtained.
- Tighten the lock nut ① while holding the adjuster ②.

Throttle cable play Ⓐ: 3–6 mm (0.12–0.24 in)



⚠ WARNING

After the adjustment is completed, check that handlebars movement does not raise the engine idle speed and that the throttle grip returns smoothly and automatically.

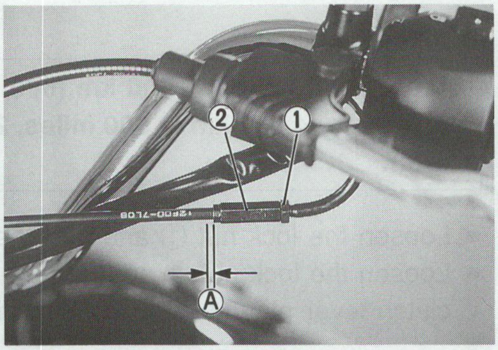


STARTER PLUNGER CABLE PLAY

Starter plunger cable play Ⓐ should be 0.5–1.0 mm (0.02–0.04 in) as shown. If the play Ⓐ is incorrect, adjust it as follows:

- Loosen the lock nut ① and turn the adjuster ② in or out until the specified play is obtained.
- Tighten the lock nut ① while holding the adjuster ②.

Starter plunger cable play Ⓐ: 0.5–1.0 mm (0.02–0.04 in)

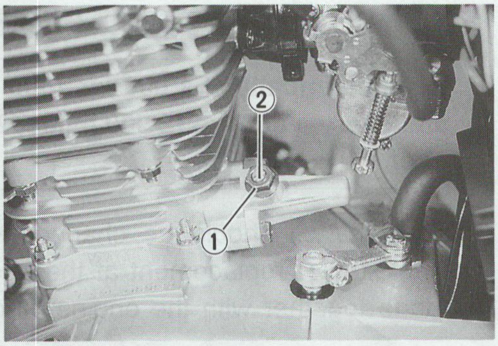


CAM CHAIN TENSION ADJUSTER

Inspect initially at 1 000 km (600 miles, 5 months) and every 4 000 km (2 500 miles, 20 months) thereafter.

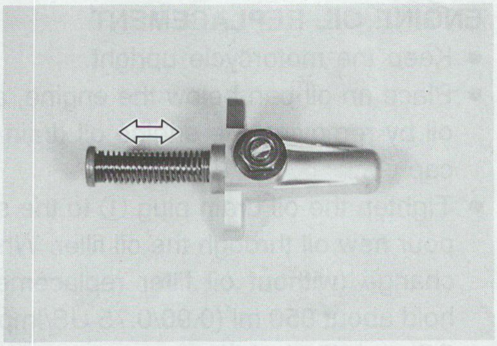
The cam chain is maintained at the proper tension by a manually adjusted tension adjuster. To prevent chain noise, the tension adjuster must be adjusted at the intervals listed above. The procedure for adjusting the cam chain tension adjuster is as follows.

- Loosen the lock nut ① on the chain tension adjuster and back out the set screw ② one turn. This will allow a spring to push the push rod firmly onto the cam chain tensioner, and provide proper operating chain tension.
- Tighten the set screw ② to lock the push rod in position and tighten the lock nut ① to secure the set screw ②.



NOTE:
If the cam chain is noisy after having been adjusted, the push rod is probably sticking. Remove the cam drive chain tension adjuster, and clean and lubricate the push rod to obtain smooth movement and proper tensioning action.

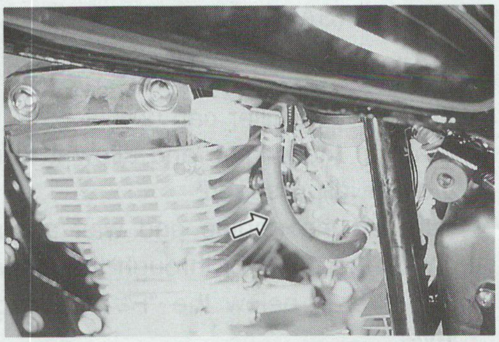
- Reinstall the cam chain tension adjuster and tighten its mounting bolts to the specified torque.



Cam chain tension adjuster mounting bolt: 7 N·m (0.7 kg-m, 5.0 lb-ft)

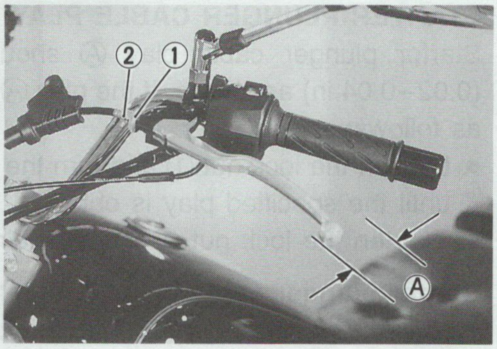
FUEL HOSE

Inspect initially at 1 000 km (600 miles, 5 months) and every 4 000 km (2 500 miles, 20 months) thereafter.
Replace every 4 years.



CLUTCH

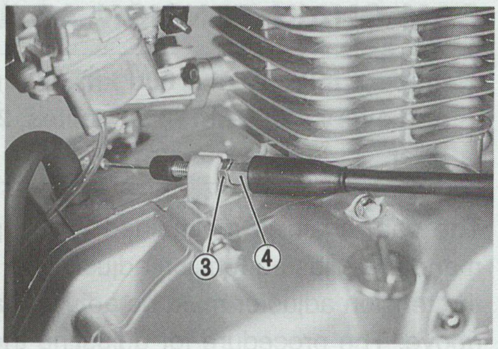
Inspect initially at 1 000 km (600 miles, 5 months) and every 4 000 km (2 500 miles, 20 months) thereafter.



- Loosen the lock nut ① and turn the adjuster ② fully in.
- Loosen the lock nut ③ and turn the adjuster ④ until the clutch lever play Ⓐ is within specificaton.

Clutch lever play Ⓐ: 10–15 mm (0.4–0.6 in)

- Tighten the lock nuts (①, ③).



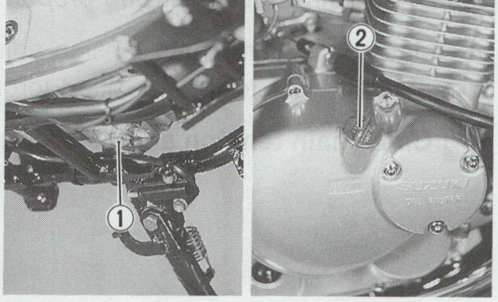
ENGINE OIL AND OIL FILTER

Replace initially at 1 000 km (600 miles, 5 months) and every 4 000 km (2 500 miles, 20 months) thereafter.

The engine oil should be changed while the engine is warm. Oil filter replacement at the above intervals should be done together with the engine oil change.

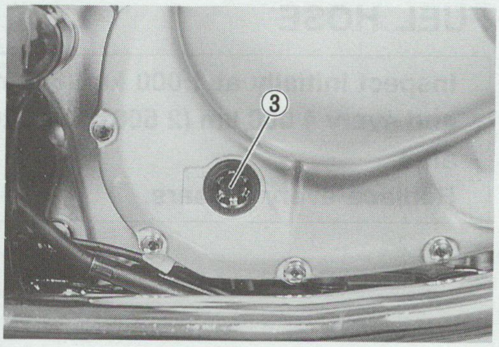
ENGINE OIL REPLACEMENT

- Keep the motorcycle upright.
- Place an oil pan below the engine, and drain the engine oil by removing the engine oil drain plug ① and oil filler cap ②.
- Tighten the oil drain plug ① to the specified torque, and pour new oil through the oil filler. When performing an oil change (without oil filter replacement), the engine will hold about 850 ml (0.90/0.75 US/Imp qt) of oil. Use SF or SG classified (API) engine oil with a viscocity rating of 10W-40 (SAE).



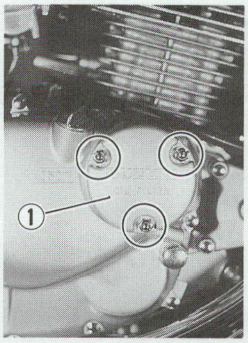
Oil drain plug: 28 N·m (2.8 kg-m, 20.0 lb-ft)

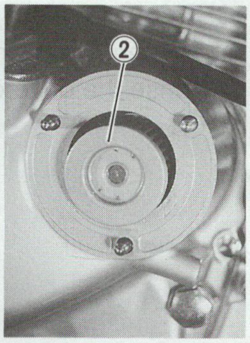
- Install the oil filler cap ②.
- Start up the engine and allow it to run for several minutes at idling speed.
- Turn off the engine and wait about one minute, then check the oil level through the inspection window ③. If the level is below the “F” mark, add oil to the proper level.

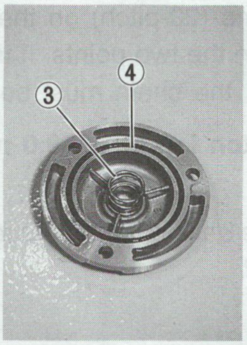


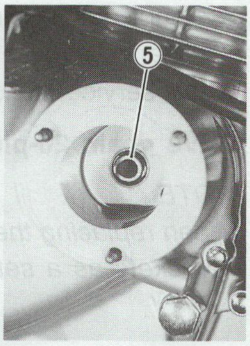
OIL FILTER REPLACEMENT

- Drain the engine oil as described in the engine oil replacement procedure.
- Remove the oil filter cap ① by removing the nuts.
- Remove the oil filter ② and install a new one.
- Install the oil filter cap ① and tighten the nuts securely.









NOTE:
Before installing the new oil filter and oil filter cap, make sure that the spring ③ and new O-rings (④, ⑤) are installed correctly.

- Add new engine oil and check the oil level as described in the engine oil replacement procedure.

Oil viscosity and classification:
10W/40 (SAE) / SF or SG (API)

NECESSARY AMOUNT OF ENGINE OIL
Oil change : 850 ml (0.90/0.75 US/Imp qt)
Oil and filter change : 950 ml (1.00/0.84 US/Imp qt)
Engine overhaul : 1 300 ml (1.37/1.14 US/Imp qt)

DRIVE CHAIN

Inspect initially at 1 000 km (600 miles, 5 months) and every 4 000 km (2 500 miles, 20 months) thereafter.
Clean and lubricate every 1 000 km (600 miles).

Visually inspect the drive chain for the possible defects listed below.

* Loose pins
* Damaged rollers
* Rusted links
* Twisted or seized links
* Excessive wear
* Kinked or binding links

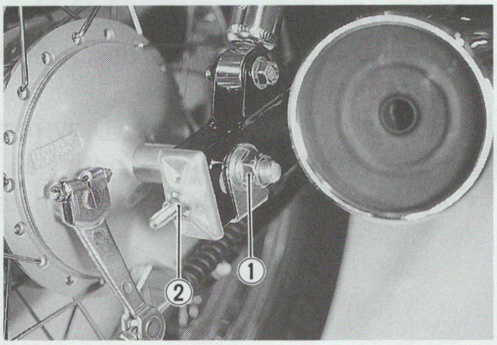
If any defects are found, the drive chain must be replaced.

⚠ CAUTION

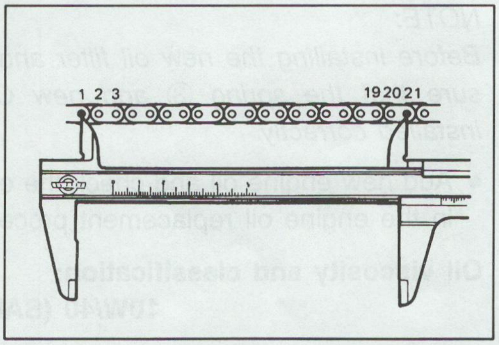
The standard drive chain is RK428FDZ. SUZUKI recommends to use this standard drive chain as a replacement.

CHECKING AND ADJUSTING

- Loosen the rear axle nut ①.
- Tense the drive chain fully by turning chain adjuster nuts ②.



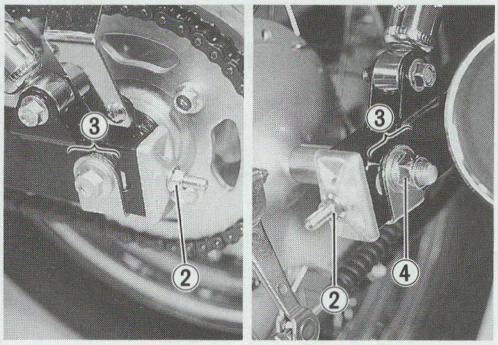
- Count out 21 pins (20-pitch) on the chain measure the distance between the two points. If the distance exceeds the service limit, the chain must be replaced.



Drive chain 20-pitch length: 259.0 mm (10.20 in)

NOTE:
When replacing the drive chain, replace the drive chain and sprockets as a set.

- Place the motorcycle on the side-stand.
- Loosen both chain adjuster nuts ② until the chain has 5–15 mm (0.2–0.6 in) of slack at the middle of the chain between the engine and rear sprockets as shown. The reference marks ③ must be at the same position on the scale to ensure that the front and rear wheels are correctly aligned.

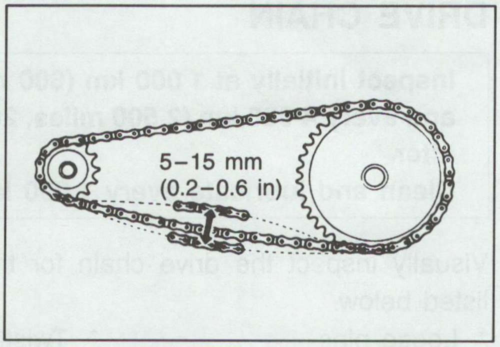


Drive chain slack: 5–15 mm (0.2–0.6 in)

- After adjusting the drive chain, tighten the rear axle nut ④ to the specified torque.

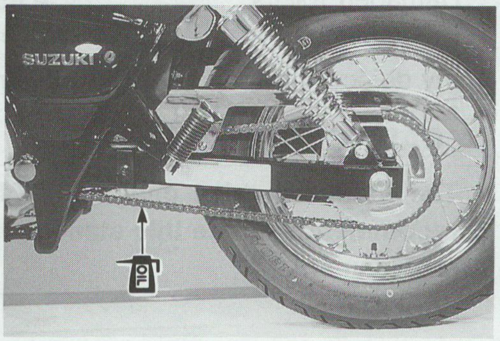
Rear axle nut: 78 N·m (7.8 kg-m, 56.5 lb-ft)

- Recheck the chain slack after tightening the axle nut and readjust if necessary.
- Tighten both chain adjuster nuts ② securely.



CLEANING AND LUBRICATING

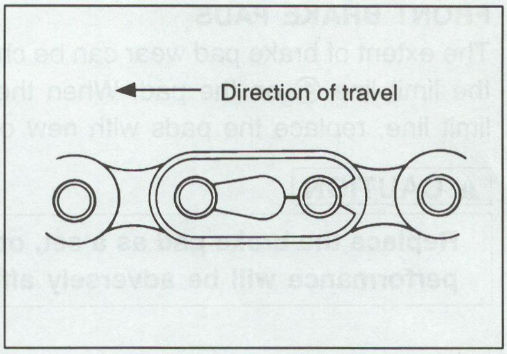
- Clean the drive chain with kerosine. If the drive chain tends to rust quickly, the intervals must be shortened.



- After cleaning and drying the chain, oil it with a heavy-weight engine oil.

NOTE:

Reassemble the drive chain clip so the slit end faces opposite the direction of rotation.

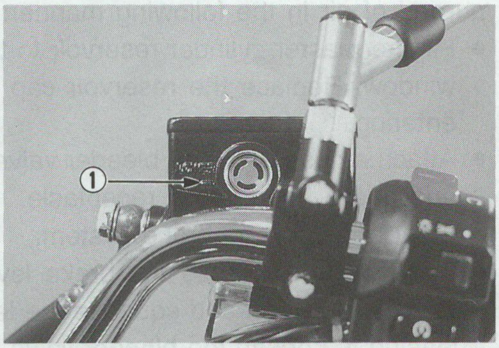


BRAKE

Inspect initially at 1 000 km (600 miles, 5 months) and every 4 000 km (2 500 miles, 20 months) thereafter.
Replace hose every 4 years.
Replace fluid every 2 years.

BRAKE FLUID LEVEL

- Keep the motorcycle upright and place the handlebars straight.
- Check the brake fluid level by observing the lower limit line on the front brake fluid reservoir.
- When the brake fluid level is below the lower limit line ①, replenish with brake fluid that meets the following specification.



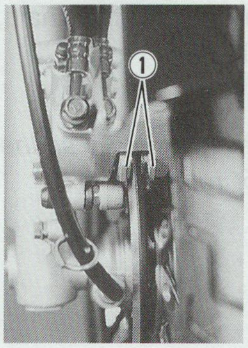
BF **Specification and classification: DOT 4**

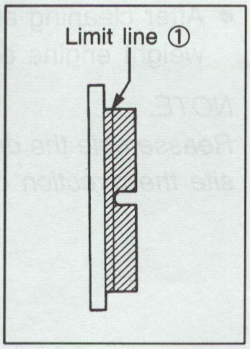
⚠WARNING

- * **The brake system of this motorcycle is filled with a glycol-based brake fluid. Do not use or mix different types of fluid such as silicone-based and petroleum-based fluids. Do not use any brake fluid taken from old, used or unsealed containers. Never re-use brake fluid left over from the last servicing or stored for a long period of time.**
- * **Brake fluid, if it leaks, will interfere with safe running and immediately discolor painted surfaces. Check the brake hose and hose joints for cracks and oil leakage.**

FRONT BRAKE PADS

The extent of brake pad wear can be checked by observing the limit line ① on the pad. When the wear exceeds the limit line, replace the pads with new ones. (See p. 5-9.)





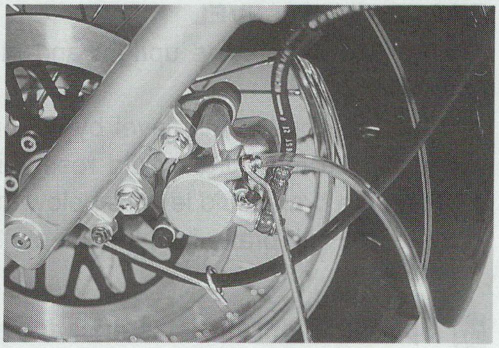
▲ CAUTION

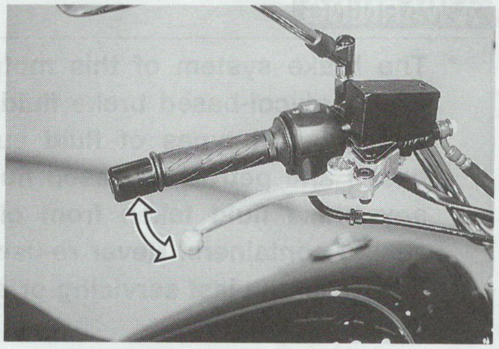
Replace the brake pad as a set, otherwise braking performance will be adversely affected.

AIR BLEEDING THE BRAKE FLUID CIRCUIT

Air trapped in the brake fluid circuit acts like a cushion to absorb a large proportion of the pressure developed by the master cylinder and thus interferes with the full braking performance of the brake caliper. The presence of air is indicated by "sponginess" of the brake lever and also by lack of braking force. Considering the danger to which such trapped air exposes the machine and rider, it is essential that, after remounting the brake and restoring the brake system to the normal condition, the brake fluid circuit be purged of air in the following manner:

- Fill the master cylinder reservoir to top of the inspection window. Replace the reservoir cap to prevent dirt from entering.
- Attach a hose to the air bleeder valve, and insert the free end of the hose into a receptacle.
- Bleed air from the brake system.
- Squeeze and release the brake lever several times in rapid succession and squeeze the lever fully without releasing it. Loosen the bleeder valve by turning it a quarter of a turn so that the brake fluid runs into the receptacle, this will remove the tension of the brake lever causing it to touch the handlebar grip. Then, close the air bleeder valve, pump and squeeze the brake lever, and open the valve. Repeat this process until the fluid flowing into the receptacle no longer contains air bubbles.





NOTE:

While bleeding the brake system, replenish the brake fluid in the reservoir as necessary. Make sure that there is always some fluid visible in the reservoir.

- Close the air bleeder valve, and disconnect the hose. Fill the reservoir with brake fluid to the top of the inspection window.

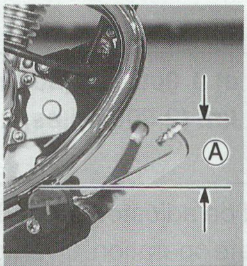
Air bleeder valve: 7.5 N·m (0.75 kg-m, 5.5 lb-ft)

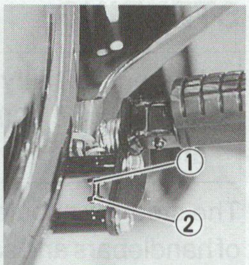
▲ CAUTION

Handle brake fluid with care: the fluid reacts chemically with paint, plastics, rubber materials, etc.

REAR BRAKE PEDAL HEIGHT

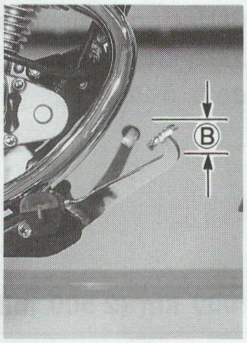
- Loosen the lock nut ①.
- Adjust the brake pedal height Ⓐ by turning the adjuster ② to locate the pedal 50 mm (2.0 in) above the top face of the footrest.

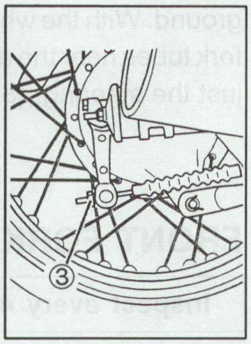




REAR BRAKE ADJUSTING

- Adjust the free travel Ⓑ to 20–30 mm (0.8–1.2 in) by turning the adjusting nut ③.



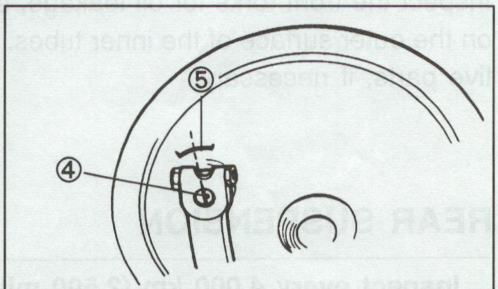


REAR BRAKE SHOE WEAR

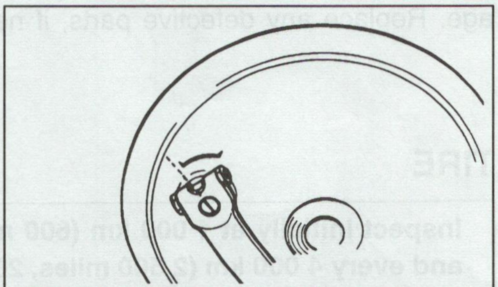
This motorcycle is equipped with brake lining wear limit indicator on the rear brake.

To check brake lining wear, perform the following steps.

- Make sure that the rear brake is properly adjusted.
- Depress the rear brake pedal. Make sure that the index mark ④ is within the range ⑤ embossed on the brake panel.
- If the index mark goes beyond the range, the brake shoe assembly should be replaced with a new set of shoes.



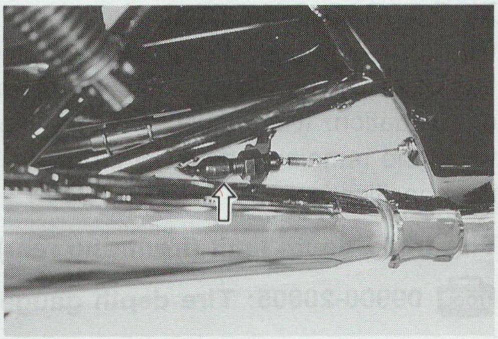
The extension line of the index mark is within the range.



The extension line of the index mark is out of the range.

BRAKE LIGHT SWITCH

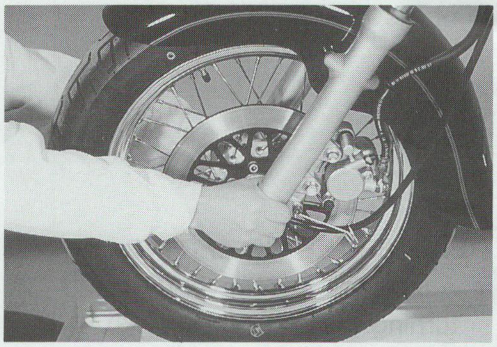
Adjust the rear brake light switch so that the brake light will come on just before pressure is felt when the brake pedal is depressed.



STEERING

Inspect initially at 1 000 km (600 miles, 5 months) and every 4 000 km (2 500 miles, 20 months) thereafter.

The steering should be adjusted properly for smooth turning of handlebars and safe operation. Overtight steering prevents smooth turning of the handlebars and too loose steering will cause poor stability. Check that there is no play in the front fork. Support the motorcycle so that the front wheel is off the ground. With the wheel facing straight ahead, grasp the lower fork tubes near the axle and pull forward. If play is found, readjust the steering. (See p. 5-28.)



FRONT FORK

Inspect every 4 000 km (2 500 miles, 20 months).

Inspect the front forks for oil leakage, scoring or scratches on the outer surface of the inner tubes. Replace any defective parts, if necessary.

REAR SUSPENSION

Inspect every 4 000 km (2 500 miles, 20 months).

Inspect the rear shock absorber for oil leakage and damage. Replace any defective parts, if necessary.

TIRE

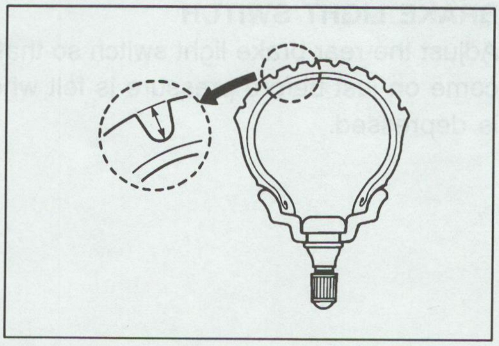
Inspect initially at 1 000 km (600 miles, 5 months) and every 4 000 km (2 500 miles, 20 months) thereafter.

TIRE TREAD CONDITION

Operating the motorcycle with excessively worn tires will decrease riding stability and consequently invite a dangerous situation. It is highly recommended to replace a tire when the remaining depth of tire tread reaches the following specification.

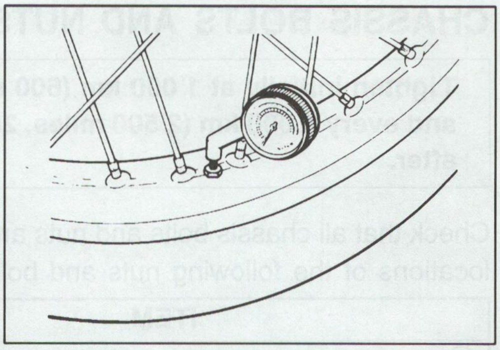
Tire tread depth limit (front and rear): 1.6 mm (0.06 in)

TOOL **09900-20805: Tire depth gauge**



TIRE PRESSURE

If the tire pressure is too high or too low, steering will be adversely affected and tire wear increased. Therefore, maintain the correct tire pressure for good roadability and a longer tire life. Cold inflation tire pressure is as follows.



COLD INFLATION TIRE PRESSURE	SOLO RIDING			DUAL RIDING		
	kPa	kg/cm²	psi	kPa	kg/cm²	psi
FRONT	175	1.75	25	175	1.75	25
REAR	200	2.00	29	225	2.25	33

⚠ CAUTION

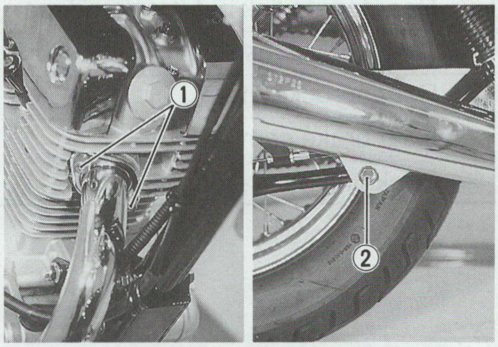
The standard tire fitted on this motorcycle is a 110/90-16 59P for the front and a 130/90-15M/C 66P for the rear. The use of tires other than those specified may cause instability. It is highly recommended to use the specified tires.

EXHAUST PIPE BOLTS AND MUFFLER MOUNTING BOLTS

Tighten initially at 1 000 km (600 miles, 5 months) and every 4 000 km (2 500 miles, 20 months) thereafter.

- Tighten the exhaust pipe bolts ① and muffler mounting bolt ② to the specified torque.

Exhaust pipe bolt ①: 11 N·m (1.1 kg-m, 8.0 lb-ft)
Muffler mounting bolt ②: 11 N·m (1.1 kg-m, 8.0 lb-ft)

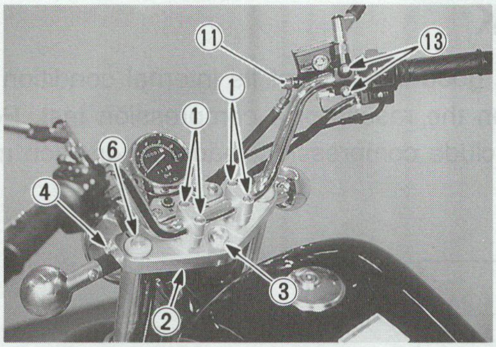


CHASSIS BOLTS AND NUTS

Tighten initially at 1 000 km (600 miles, 5 months) and every 4 000 km (2 500 miles, 20 months) thereafter.

Check that all chassis bolts and nuts are tightened to their specified torque. (Refer to page 2-18 for the locations of the following nuts and bolts on the motorcycle.)

ITEM	N·m	kg-m	lb-ft
① Handlebar clamp bolt	16	1.6	11.5
② Handlebar holder nut	45	4.5	32.5
③ Steering stem head bolt	65	6.5	47.0
④ Front fork upper clamp bolt	23	2.3	16.5
⑤ Front fork lower clamp bolt	33	3.3	24.0
⑥ Front fork cap bolt	23	2.3	16.5
⑦ Front fork damper rod bolt	20	2.0	14.5
⑧ Front axle	65	6.5	47.0
⑨ Front axle pinch bolt	23	2.3	16.5
⑩ Front brake caliper mounting bolt	39	3.9	28.0
⑪ Front brake hose union bolt	23	2.3	16.5
⑫ Front brake caliper air bleeder valve	7.5	0.75	5.5
⑬ Front brake master cylinder mounting bolt	10	1.0	7.0
⑭ Front brake disc bolt	23	2.3	16.5
⑮ Front brake pad mounting bolt	18	1.8	13.0
⑯ Front footrest bolt	26	2.6	19.0
⑰ Swingarm pivot nut	72	7.2	52.0
⑱ Rear axle nut	78	7.8	56.5
⑲ Rear torque link nut (front and rear)	13	1.3	9.5
⑳ Rear shock absorber mounting bolt or nut	29	2.9	21.0
㉑ Rear sprocket nut	50	5.0	36.0
㉒ Rear brake cam lever bolt	10	1.0	7.0
㉓ Spoke nipple	4.5	0.45	3.5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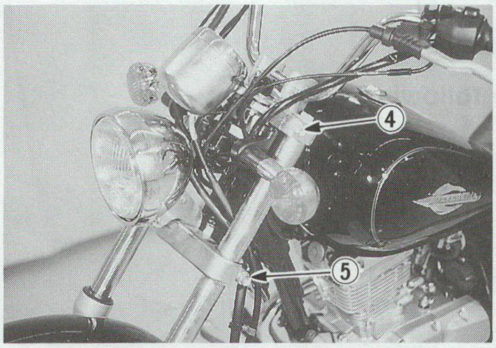
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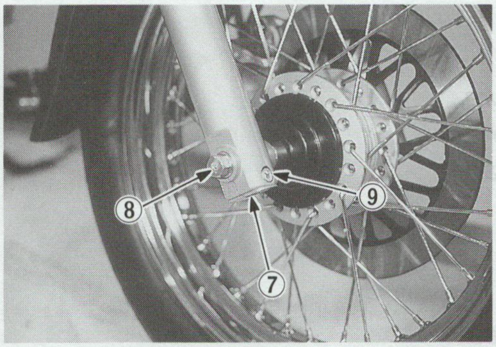
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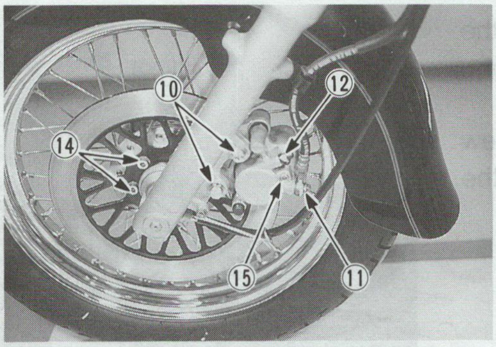
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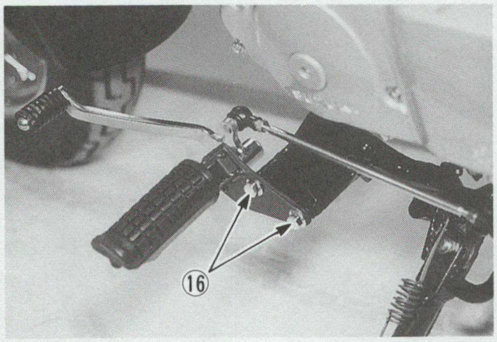
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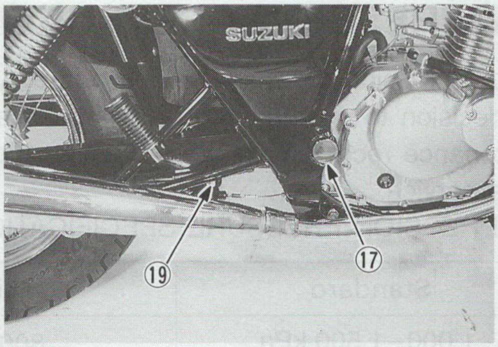
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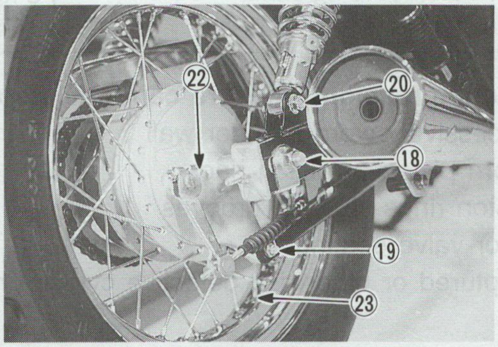
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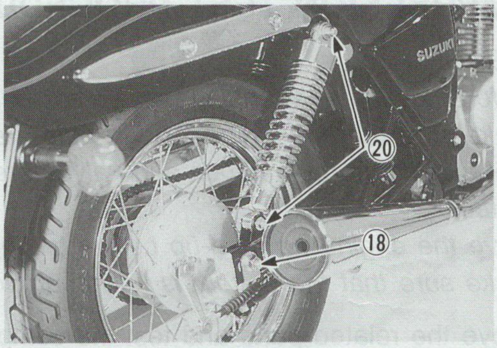
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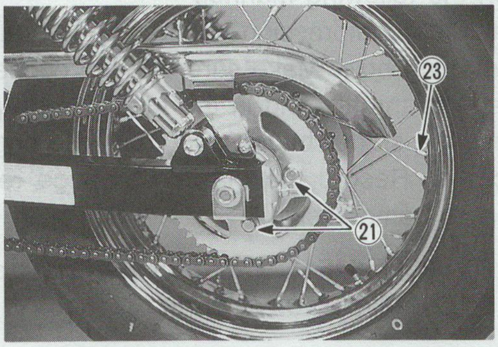
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COMPRESSION PRESSURE CHECK

The compression pressure reading of the cylinder is a good indicator of its internal condition.
The decision to overhaul the cylinder is often based on the results of a compression test. Periodic maintenance records kept at your dealership should include compression readings for each maintenance service.

COMPRESSION PRESSURE SPECIFICATION

Standard	Limit
1 000–1 500 kPa (10.0–15.0 kg/cm^2 142–213 psi)	800 kPa (8 kg/cm^2 114 psi)

Low compression pressure can indicate any of the following conditions:

* Excessively worn cylinder wall
* Worn piston or piston rings
* Piston rings stuck in grooves
* Poor valve seating
* Ruptured or otherwise defective cylinder head gasket

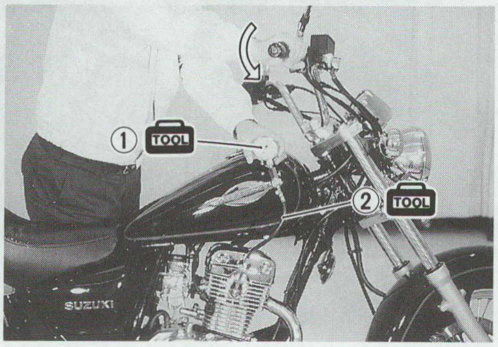
COMPRESSION TEST PROCEDURE

NOTE:

** Before testing the engine for compression pressure, make sure that the cylinder head nuts are tightened to the specified torque values and valves are properly adjusted.*
** Have the engine warmed-up before testing.*
** Make sure that the battery is fully-charged.*

Remove the related parts and test the compression pressure in the following manner.

- Install the compression gauge ① and adaptor ② in the spark plug hole. Make sure that the connection is tight.
- Keep the throttle grip in the fully opened position.
- Press the starter button and crank the engine for a few seconds. Record the maximum gauge reading as the cylinder compression.



TOOL ① **09915-64510: Compression gauge**
② **09915-63210: Adaptor**

OIL PRESSURE CHECK

Check the oil pressure periodically. This will give a good indication of the condition of the moving parts.

OIL PRESSURE SPECIFICATION

Above 10 kPa (0.1 kg/cm^2, 1.42 psi)
Below 30 kPa (0.3 kg/cm^2,4.27 psi) **at 3 000 r/min., Oil temp. at 60°C (140°F)**

If the oil pressure is lower or higher than the specification, the following causes may be considered.

LOW OIL PRESSURE

* Clogged oil filter
* Oil leakage from the oil passage
* Damaged O-ring
* Defective oil pump
* Combination of the above items

HIGH OIL PRESSURE

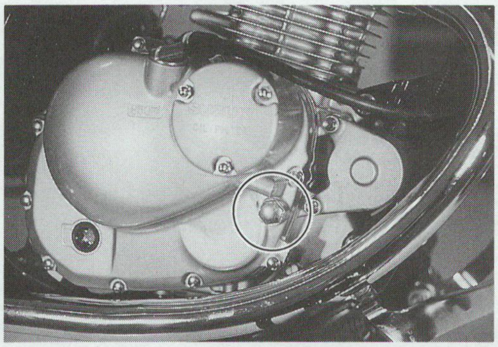
* Engine oil viscosity is too high
* Clogged oil passage
* Combination of the above items

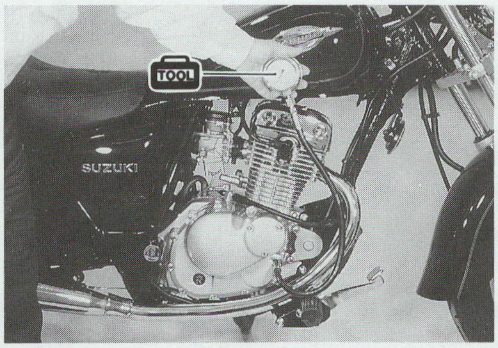
OIL PRESSURE TEST PROCEDURE

Check the oil pressure in the following manner.

- Install the oil pressure gauge in the position shown.
- Connect an electric tachometer.
- Warm up the engine as follows:
  Summer 10 min. at 2 000 r/min.
  Winter 20 min. at 2 000 r/min.
- After warm up, increase the engine speed to 3 000 r/min. and read the oil pressure gauge.

TOOL **09915-74510: Oil pressure gauge**





ENGINE

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ENGINE COMPONENTS REMOVABLE WITH THE ENGINE IN PLACE

The parts listed below can be removed and reinstalled without removing the engine from the frame. Refer to the pages listed in each section for removal and reinstallation instructions.

ENGINE CENTER

	See page
Exhaust pipe and muffler	3-2 and -9
Carburetor	3-3 and -8
Cam chain tension adjustor	3-11 and -58
Cylinder head cover	3-10 and -58
Camshaft	3-11 and -57
Cylinder head	3-11 and -56
Cylinder	3-12 and -55
Piston	3-12 and -54
Starter motor	3-4 and -13
Oil sump filter	3-19 and -45

ENGINE LEFT SIDE

	See page
Gearshift lever	3-2
Engine sprocket cover	3-2
Engine sprocket	3-3 and -8
Generator cover	3-12 and -53
Generator rotor	3-16 and -48
Starter idle gear	3-13
Signal generator	3-39
Stator coil	3-39
Cam chain	3-17 and -57
Neutral switch	3-17 and -48

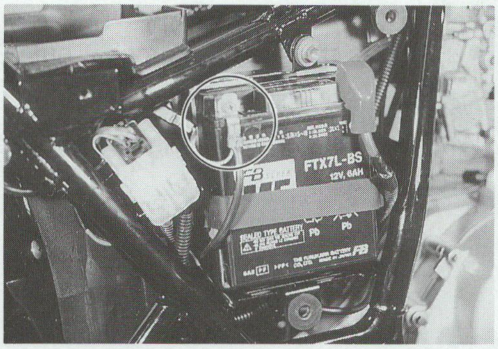
ENGINE RIGHT SIDE

	See page
Oil filter	3-44
Clutch cover	3-13 and -53
Clutch	3-13 and -51
Oil pump	3-15 and -49
Gearshift shaft	3-15 and -50
Primary drive gear	3-16 and -49

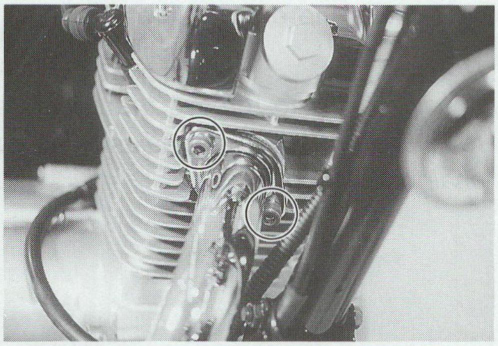
ENGINE REMOVAL AND REINSTALLATION

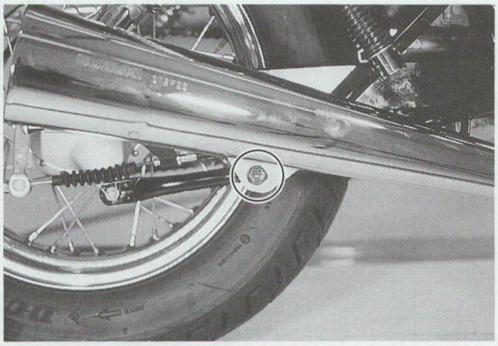
ENGINE REMOVAL

- Remove the front seat. (See p. 5-1.)
- Remove the fuel tank. (See p. 4-1.)
- Remove the left frame cover. (See p. 5-1.)
- Disconnect the battery ⊖ lead wire.
- Drain the engine oil. (See p. 2-9.)

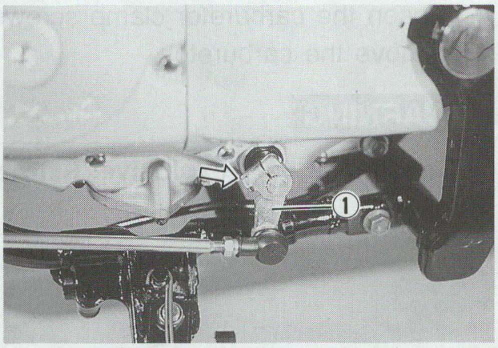


- Remove the exhaust pipe bolts and muffler mounting bolts.

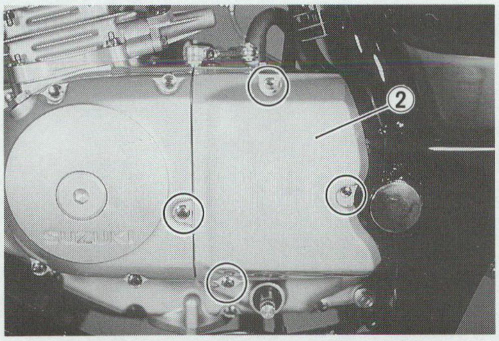




- Remove the gearshift lever ①.

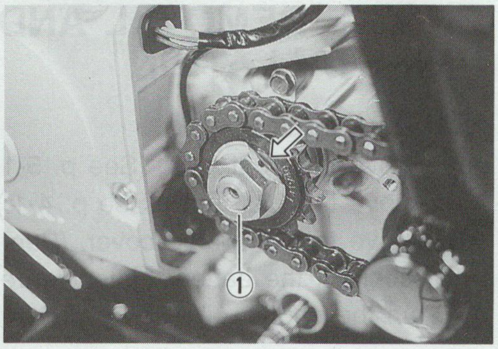


- Remove the engine sprocket cover ②.



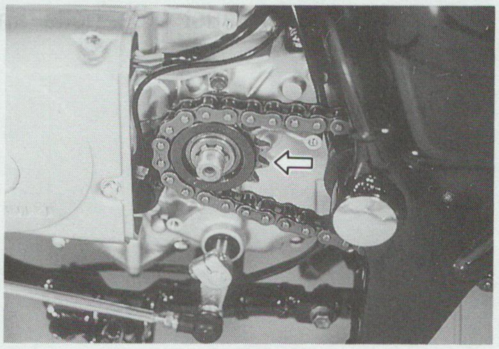
- Flatten the lock washer.
- Remove the engine sprocket nut ① and washer.

NOTE:
When loosening the engine sprocket nut, depress the brake pedal.

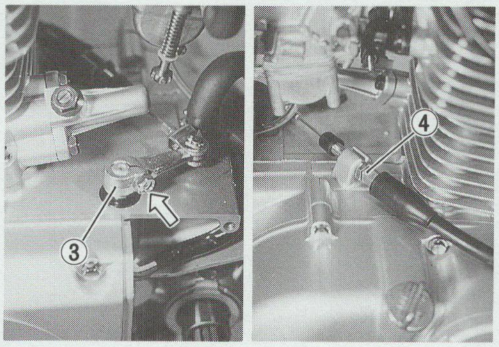


- Remove the engine sprocket.

NOTE:
If it is difficult to remove the engine sprocket, loosen the rear axle nut and chain adjuster nuts to provide additional chain slack.



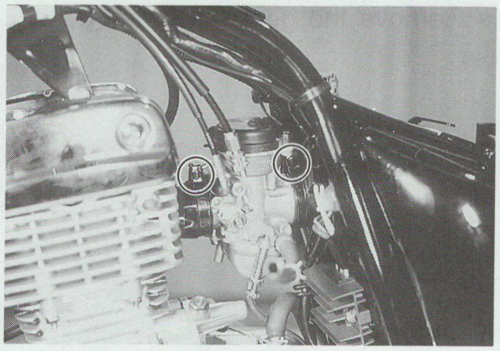
- Remove the clutch release arm ③.
- Remove the clutch cable adjuster ④.



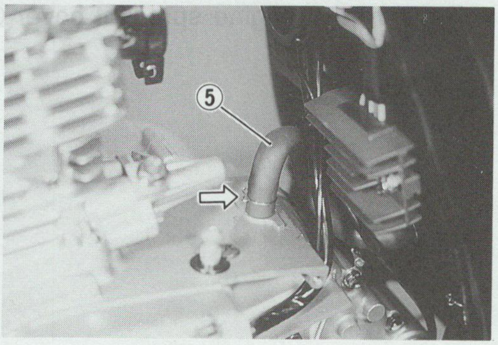
- Loosen the carburetor clamp screws.
- Remove the carburetor.

⚠WARNING

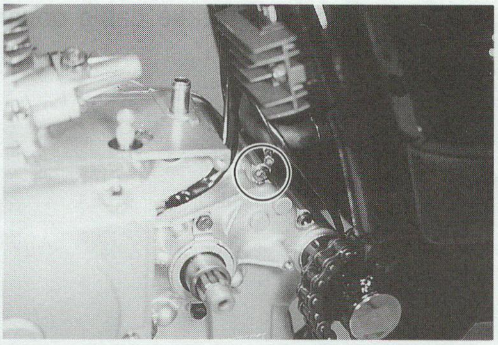
Gasoline is very explosive. Extreme care must be taken.



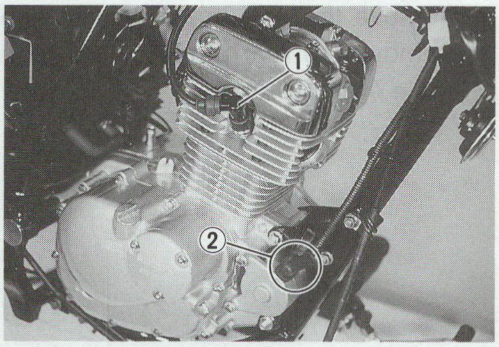
- Disconnect the crankcase breather hose ⑤.



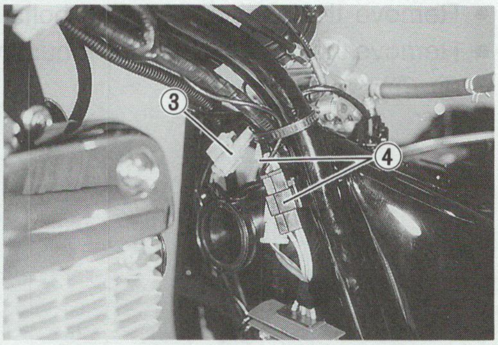
- Disconnect the engine ground wire.



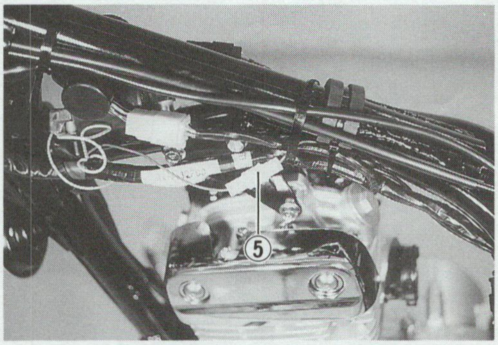
- Disconnect the spark plug cap ①.
- Disconnect the starter motor lead wire ②.



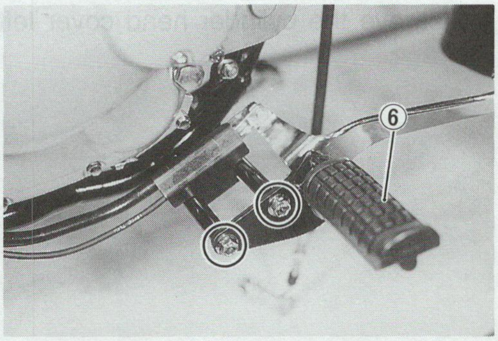
- Disconnect the side-stand switch coupler ③.
- Disconnect the generator couplers ④.



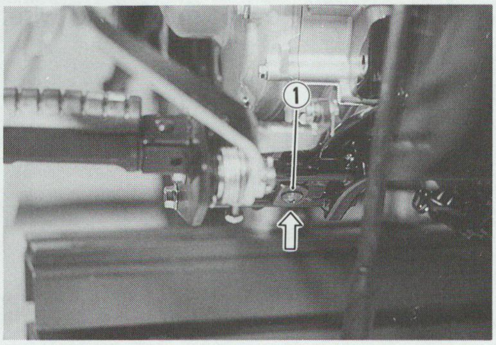
- Disconnect the neutral switch coupler ⑤.



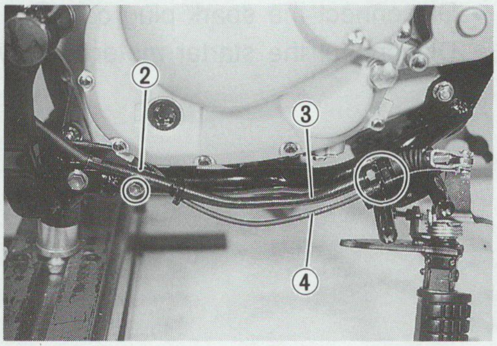
- Support the motorcycle with a jack or wooden block.
- Remove the right footrest ⑥.



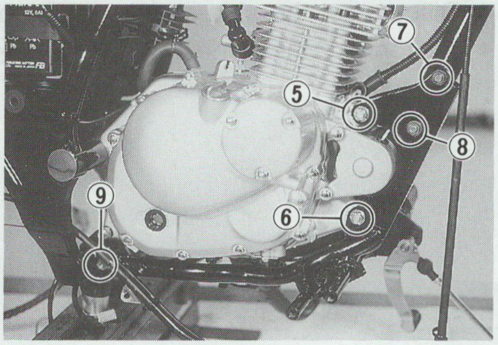
- Remove the rear brake cable cover ①.

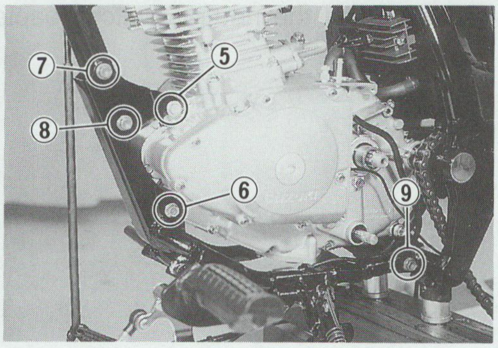


- Remove the rear brake cable guide ②
- Remove the rear brake cable ③ and rear brake switch cable ④.

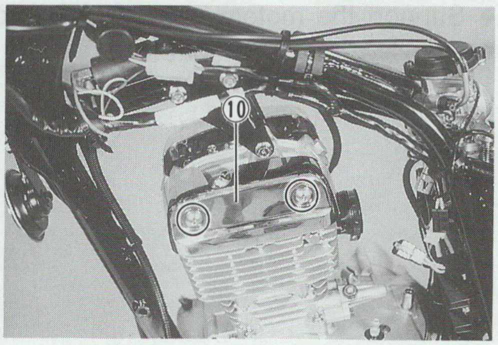


- Remove the engine mounting bolts and nuts (⑤, ⑥).
- Remove the frame down tube mounting bolts and nuts (⑦, ⑧, ⑨).

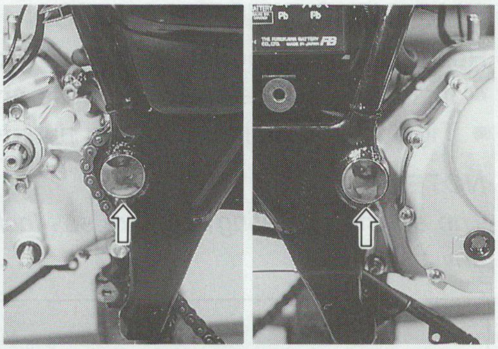




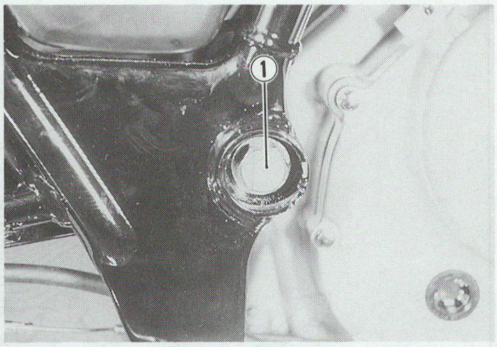
- Remove the cylinder head cover left cap ⑩.



- Remove the left and right swingarm pivot end caps.

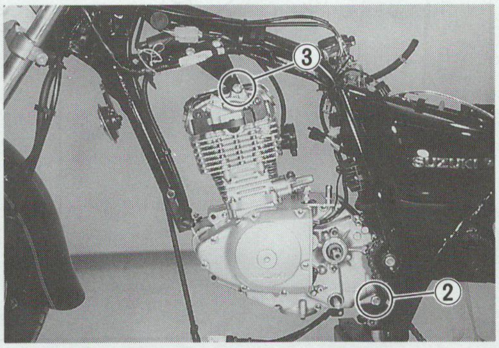


- Remove the swingarm pivot nut ① and washer.



- Remove the lower engine mounting bolt and nut ②.
- Remove the upper engine mounting bolt and nut ③.

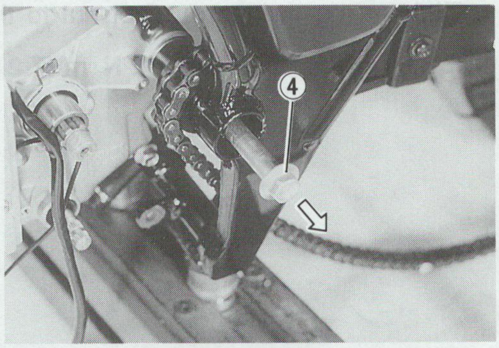
NOTE:
When removing the upper mounting bolt, support the engine with a jack.



- Partially remove the swingarm pivot shaft ④ so that the engine can be removed.

NOTE:
Be careful not to draw out the pivot shaft.

- Gradually lower the engine.

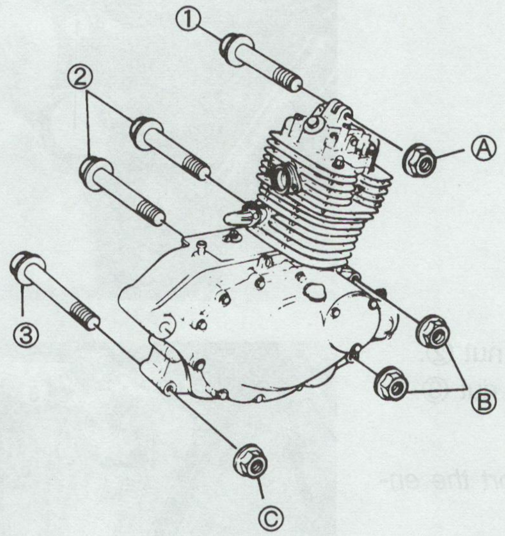


ENGINE REINSTALLATION

Reinstall the engine in the reverse order of engine removal.

- Install the engine mounting bolts and nuts as shown in the following illustration.
- Tighten the engine mounting nuts to the specified torque.

NOTE:
The engine mounting nuts are self-locking. Once the nuts have been removed, they are no longer of any use.



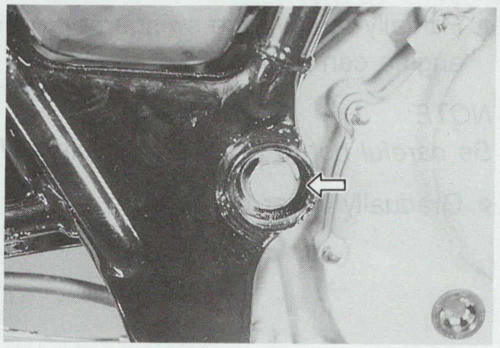
ITEM	N·m	kg-m	lb-ft
Ⓐ	41	4.1	29.5
Ⓑ	41	4.1	29.5
Ⓒ	41	4.1	29.5

BOLT LENGTH

①	50 mm (2.0 in)
②	80 mm (3.2 in)
③	88 mm (3.5 in)

- Tighten the swingarm pivot nut to the specified torque.

Swingarm pivot nut: 72 N·m (7.2 kg-m, 52.0 lb-ft)

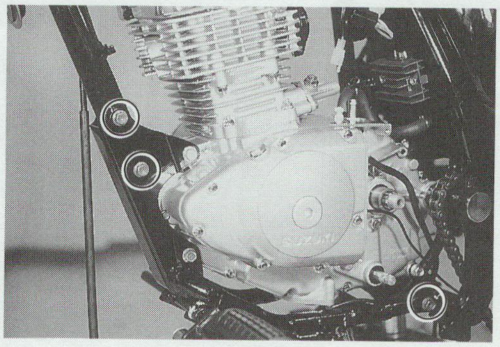


- Tighten the frame down tube mounting bolts to the specified torque.

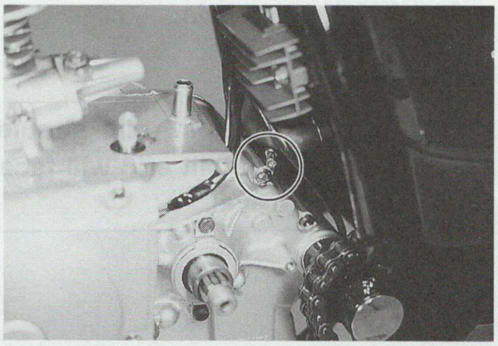
Frame down tube mounting bolt: 23 N·m (2.3 kg-m, 16.5 lb-ft)

NOTE:
Apply a small quantity of THREAD LOCK "1303" to the threads of bolts.

1303 **99000-32030: THREAD LOCK SUPER "1303"**

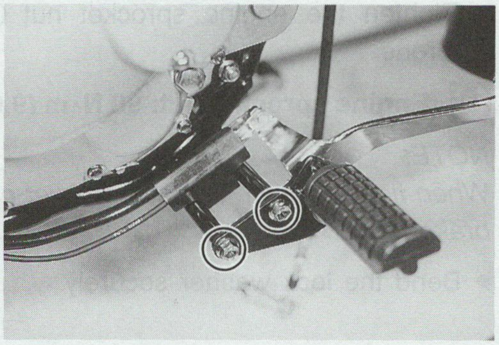


- Tighten the engine ground wire by crankcase bolt as shown.

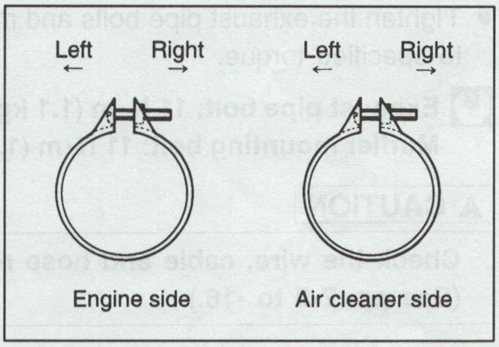


- Install the right footrest and tighten its mounting bolts to the specified torque.

Front footrest bolt: 26 N·m (2.6 kg-m, 19.0 lb-ft)

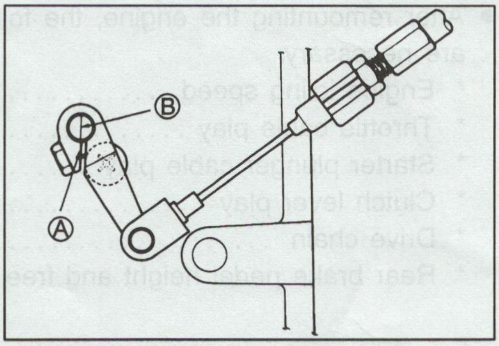


- Position the carburetor clamps as shown in the illustration.

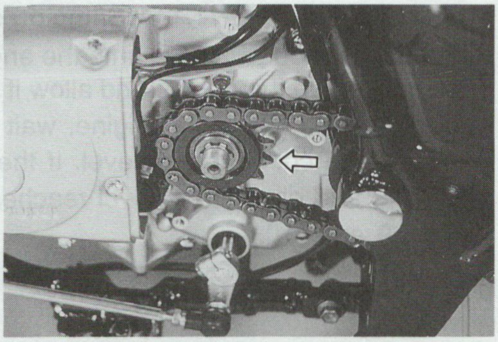


- Install the clutch release arm as shown in the illustration.

NOTE:
Align the release arm slit surface Ⓐ with the notch mark Ⓑ on the release camshaft.



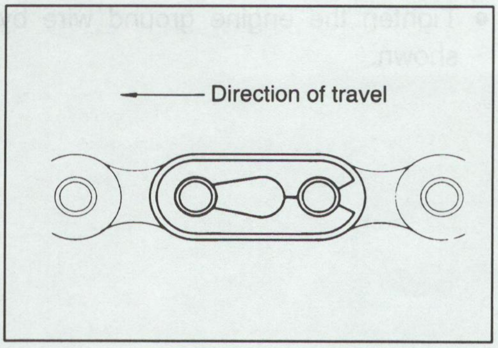
- Loosen the rear axle nut and drive chain adjuster nuts.
- Installing the engine sprocket as shown.



- Install the drive chain.

▲ CAUTION

The drive chain joint clip should be attached in the way that the slit end will face opposite to the direction of travel.

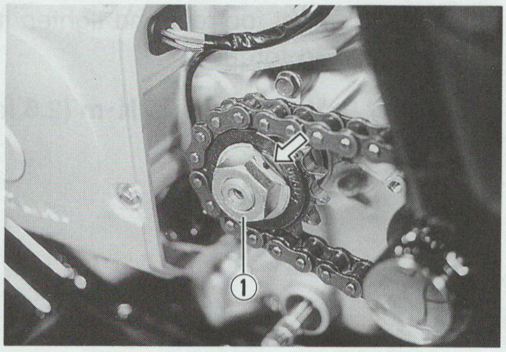


- Tighten the engine sprocket nut ① to the specified torque.

Engine sprocket nut: 90 N·m (9.0 kg-m, 65.0 lb-ft)

NOTE:
When tightening the engine sprocket nut, depress the rear brake pedal.

- Bend the lock washer securely.

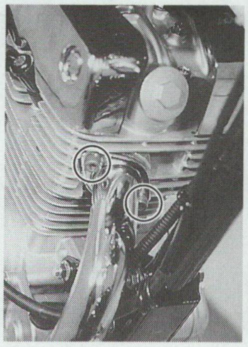


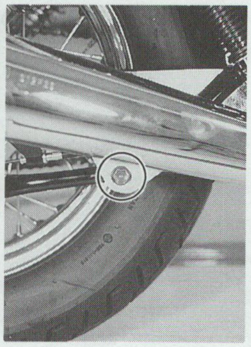
- Tighten the exhaust pipe bolts and muffler mounting bolt to specified torque.

Exhaust pipe bolt: 11 N·m (1.1 kg-m, 8.0 lb-ft)
Muffler mounting bolt: 11 N·m (1.1 kg-m, 8.0 lb-ft)

▲ CAUTION

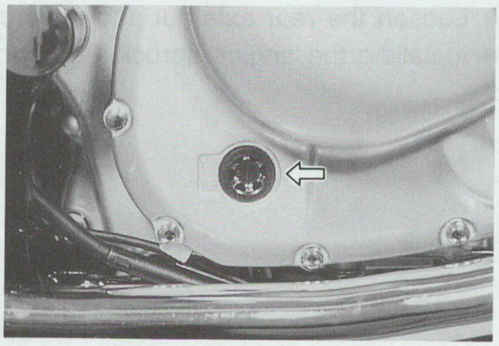
Check the wire, cable and hose routing.
(See pp. 7-9 to -16.)





- After remounting the engine, the following adjustments are necessary.
  - * Engine idling speed .... See p. 2-7.
  - * Throttle cable play .... See p. 2-7.
  - * Starter plunger cable play .... See p. 2-8.
  - * Clutch lever play .... See p. 2-9.
  - * Drive chain .... See pp. 2-10 to -12.
  - * Rear brake pedal height and free travel .... See p. 2-14.

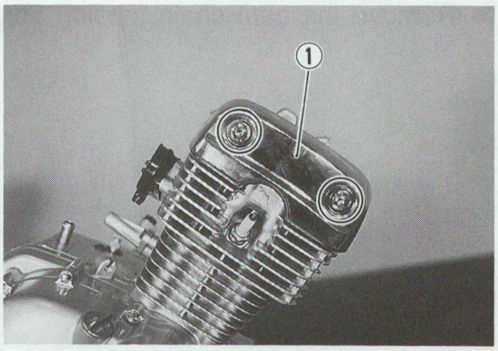
- Pour 1 300 ml (1.37/1.14 US/Imp qt) of SAE 10W/40 engine oil, graded SF or SG, into the engine after overhauling it. Start up the engine and allow it run for few minutes at idle speed. Stop the engine, wait approximately one minute and check the oil level. If the level is below the "L" line, add oil until the level reaches the "F" line. (See pp. 2-9 and -10.)



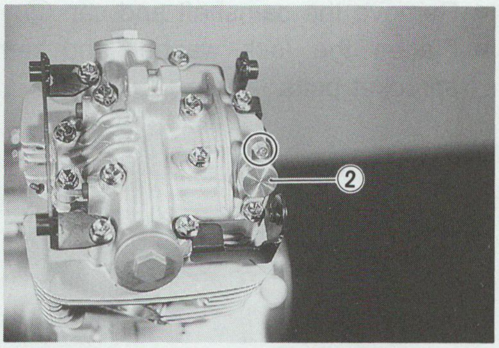
ENGINE DISASSEMBLY

The procedure for engine disassembly is sequentially explained in the following steps.

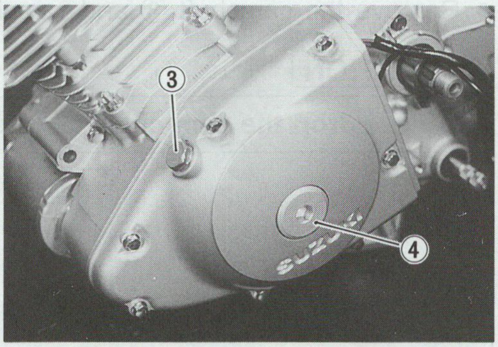
- Remove the cylinder head cover right cap ①.
- Remove the spark plug.



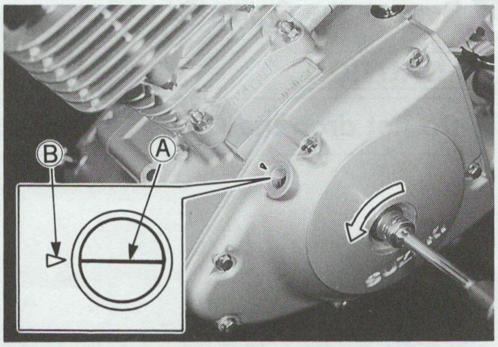
- Remove the cylinder head cover plug ②.



- Remove the valve timing inspection plug ③ and generator cover cap ④.



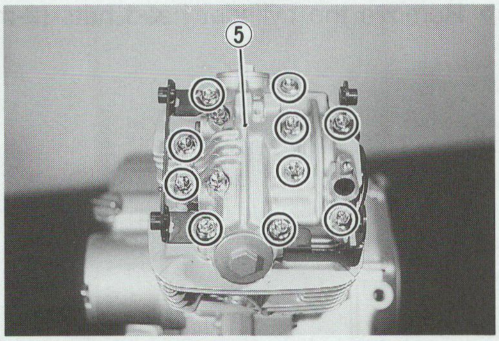
- Rotate the crankshaft and align the line Ⓐ on the generator rotor with the mark Ⓑ on the generator cover.



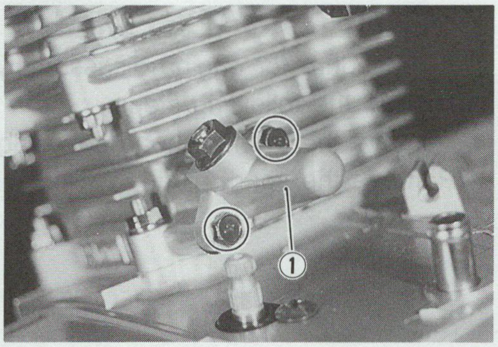
- Remove the cylinder head cover ⑤.

NOTE:

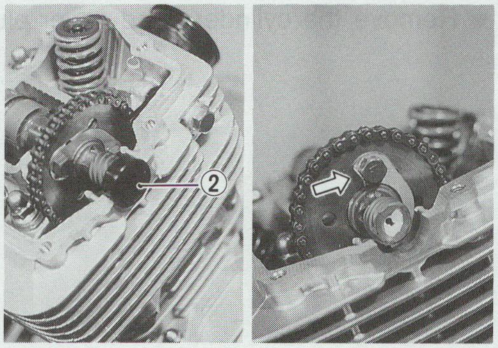
If the cylinder head cover does not come off, lightly tap on the finless portion of it with a plastic mallet to make the gasketed joint loose.



- Remove the cam chain tension adjuster ①.



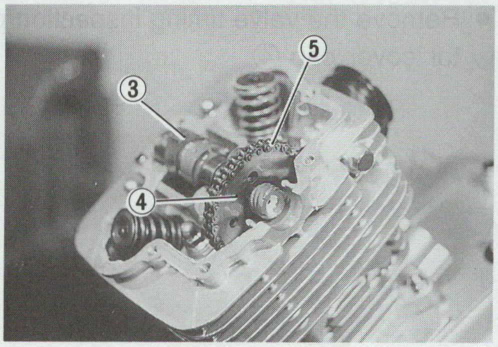
- Remove the camshaft end cap ②.
- Flatten the lock washer and remove the camshaft sprocket bolts.



- Remove the camshaft ③ and camshaft sprocket ④.

⚠ CAUTION

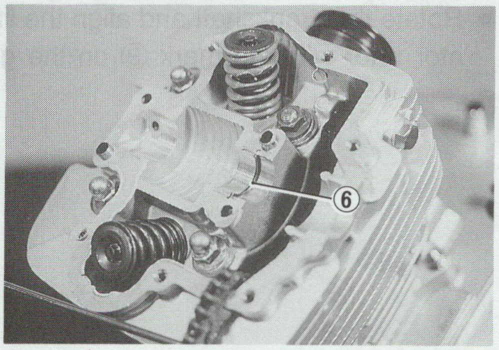
Do not drop the cam chain ⑤ into the crankcase.



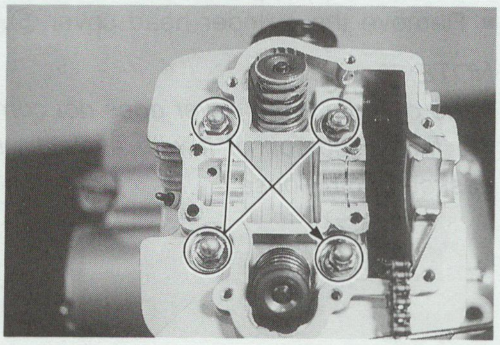
- Remove the C-ring ⑥.

⚠ CAUTION

Do not drop the C-ring into the crankcase.

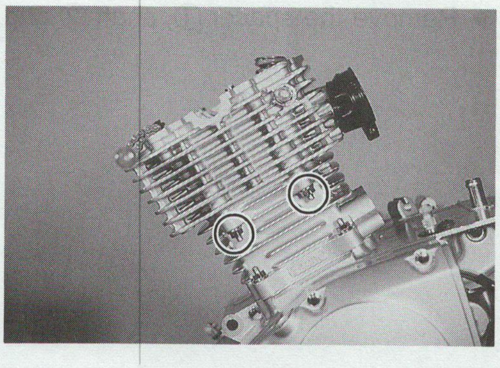


- Remove the cylinder head nuts (8-mm) diagonally.



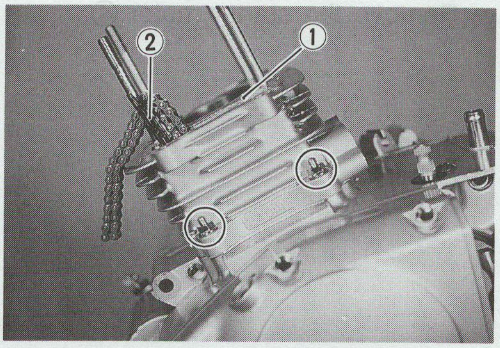
- Remove the cylinder head by removing the cylinder head nuts (6-mm).

NOTE:
If the cylinder head does not come off, lightly tap on the finless portion of it with a plastic mallet.

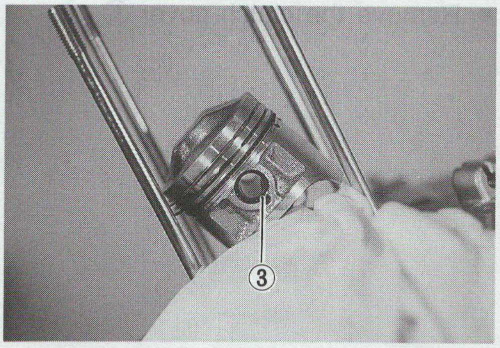


- Remove the cylinder head gasket ①.
- Remove the cam chain guide ②.
- Remove the cylinder by removing the nuts.

NOTE:
If the cylinder does not come off, lightly tap on the finless portion of it with a plastic mallet to make the gasketed joint loose.



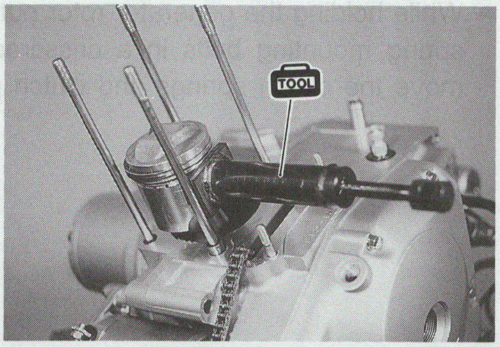
- Place a clean rag over the cylinder base to prevent the piston pin circlip ③ from dropping into the crankcase. Then, remove the piston pin circlip ③ with a long-nose pliers.



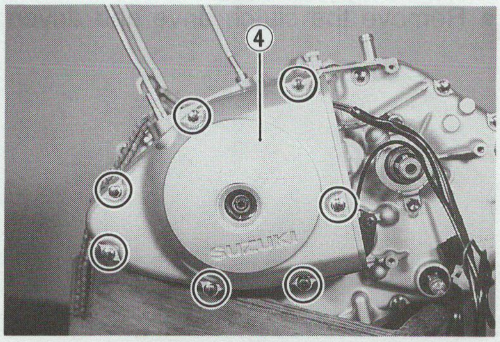
- Remove the piston pin using the special tool.

TOOL **09910-34510: Piston pin puller**

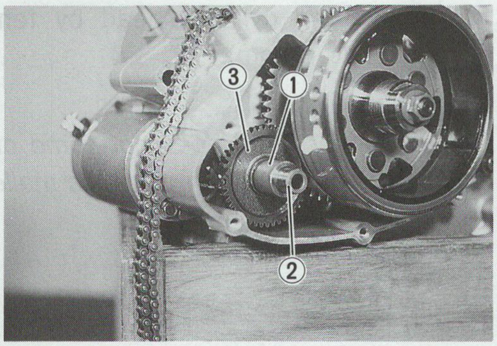
- Remove the piston.



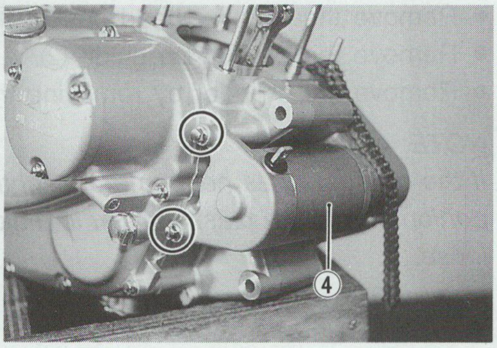
- Remove the generator cover ④.



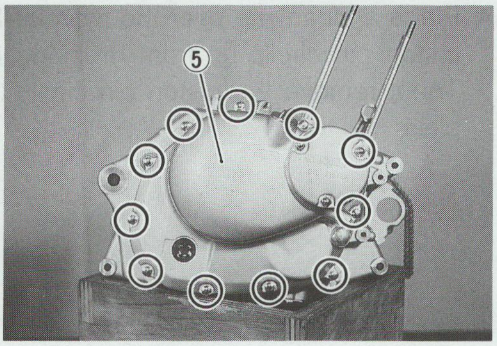
- Remove the spacer ①, shaft ② and starter idle gear ③.



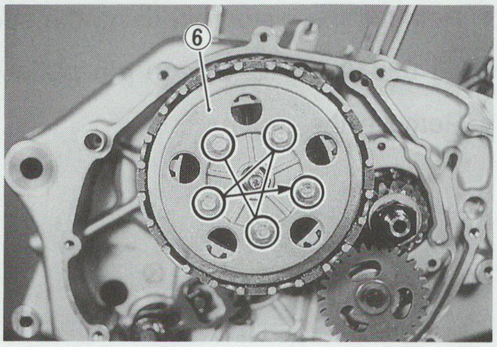
- Remove the starter motor ④.



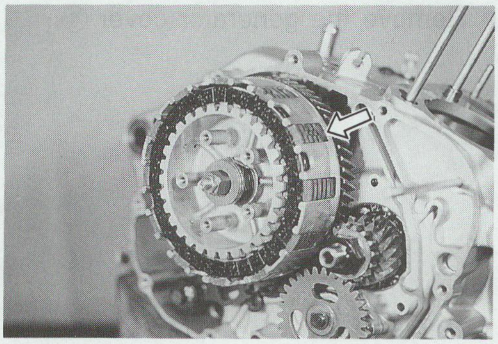
- Remove the clutch cover ⑤.



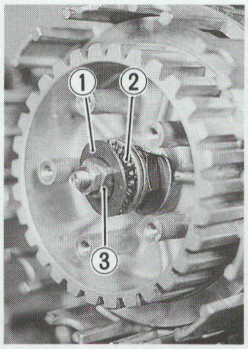
- While holding the generator rotor nut, remove the clutch spring mounting bolts in a crisscross pattern, and remove the clutch springs and clutch pressure plate ⑥.

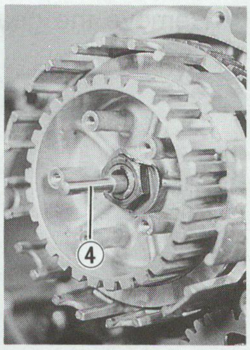


- Remove the clutch drive and driven plates.

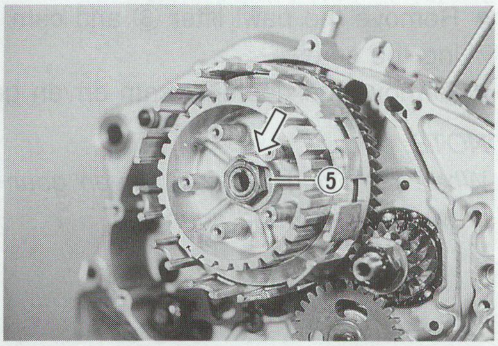


- Remove the washer ①, bearing ②, clutch push piece ③ and clutch push rod ④.





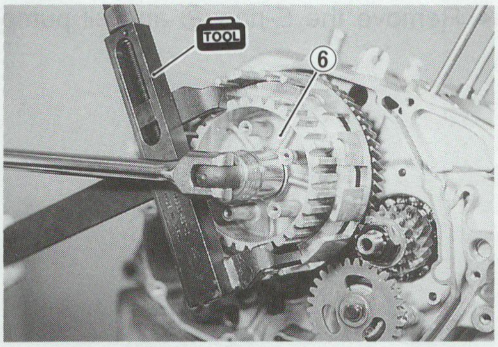
- Flatten the lock washer ⑤ of the clutch sleeve hub nut.



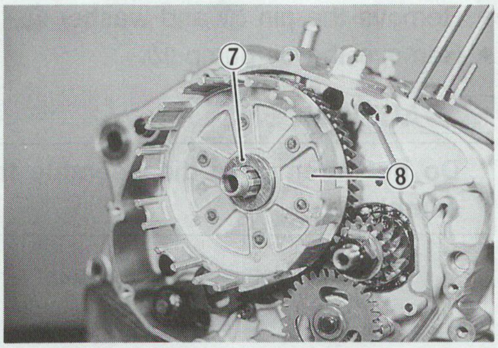
- Remove the clutch sleeve hub nut using the special tool.

TOOL 09920-53740: Clutch sleeve hub holder

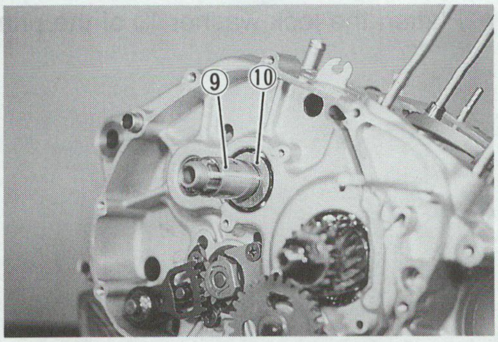
- Remove the clutch sleeve hub ⑥.



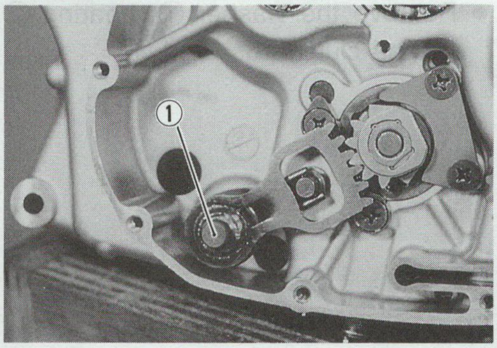
- Remove the thrust washer ⑦ and primary driven gear assembly ⑧.



- Remove the spacer ⑨ and thrust washer ⑩.

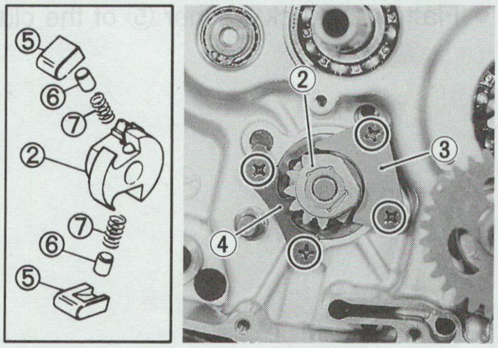


- Remove the gearshift shaft ①.

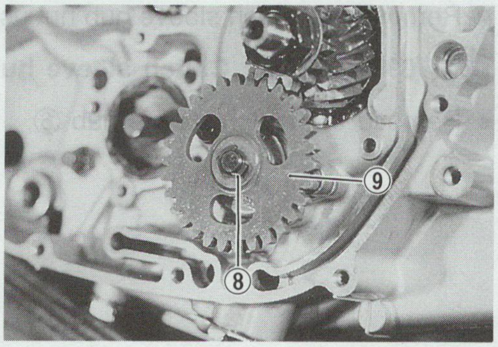


- Remove the pawl lifter ③ and cam guide ④ by removing the screws.
- Remove the gearshift cam driven gear ②.

NOTE:
When removing the cam driven gear ②, do not lose the pawl ⑤, pin ⑥ and spring ⑦.



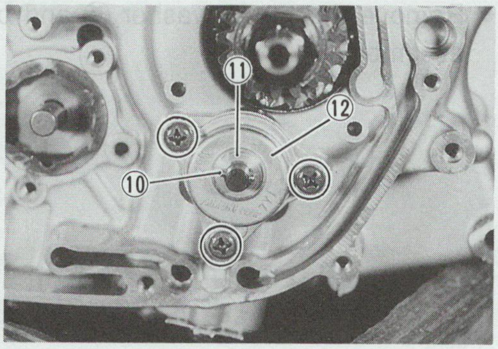
- Remove the E-ring ⑧ and oil pump driven gear ⑨.



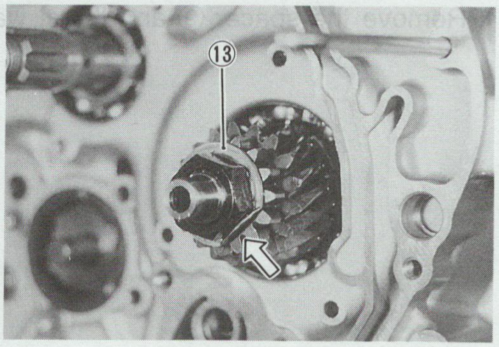
- Remove the pin ⑩ and washer ⑪.
- Remove the oil pump ⑫.

⚠ CAUTION

Do not attempt to disassemble the oil pump assembly.

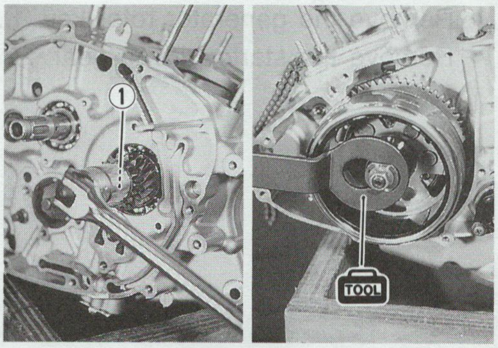


- Flatten the lock washer ⑬ of the primary drive gear nut.



- Remove the primary drive gear/oil pump drive gear nut ① using the special tool.

TOOL 09930-44530: Rotor holder

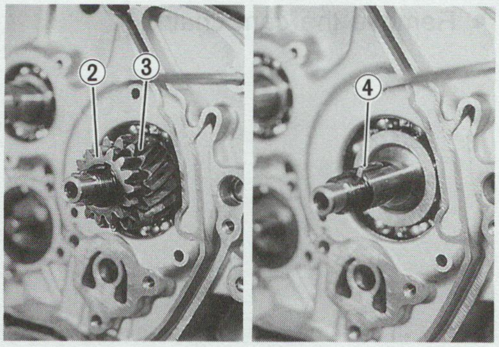


⚠ CAUTION

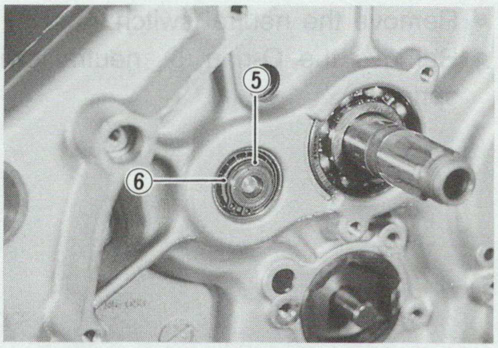
The primary drive gear/oil pump drive gear nut has left-hand threads.

- Remove the washer.

- Remove the oil pump drive gear ② and primary drive gear ③.
- Remove the key ④.

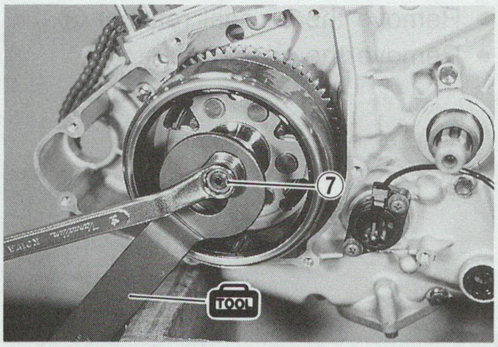


- Remove the circlip ⑤ and washer ⑥.



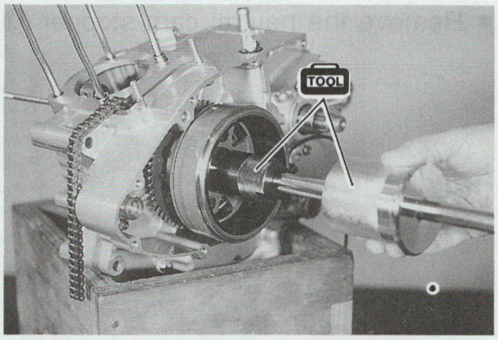
- Remove the generator rotor nut ⑦ using the special tool.

TOOL 09930-44530: Rotor holder

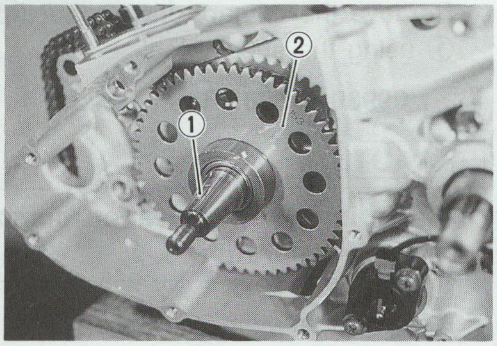


- Remove the generator rotor using the special tools.

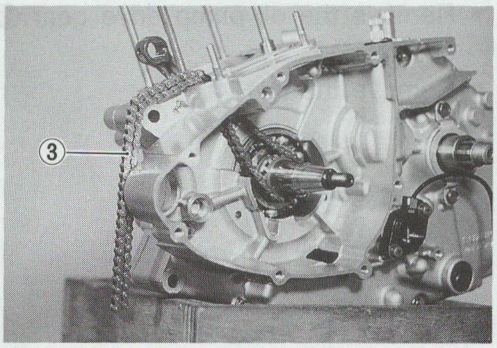
TOOL 09930-30180: Rotor remover attachment
09930-30102: Sliding shaft



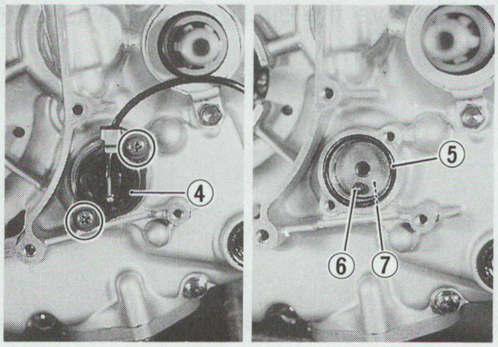
- Remove the generator rotor key ①.
- Remove the starter driven gear ②.



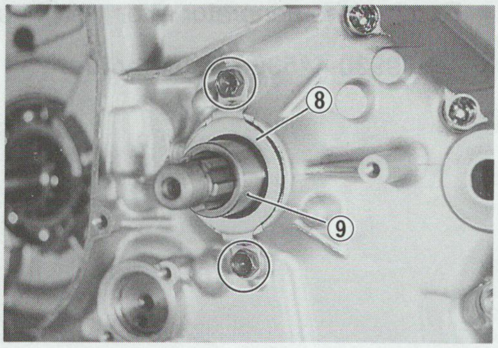
- Remove the cam chain ③.



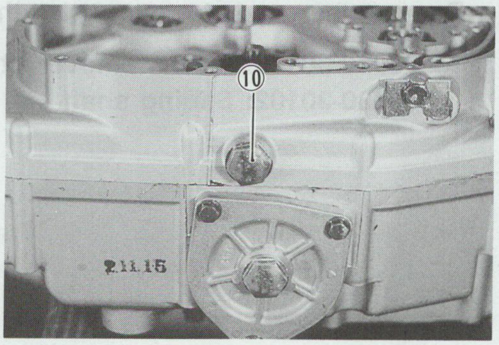
- Remove the neutral switch ④.
- Remove the O-ring ⑤, neutral switch contact ⑥ and spring ⑦.



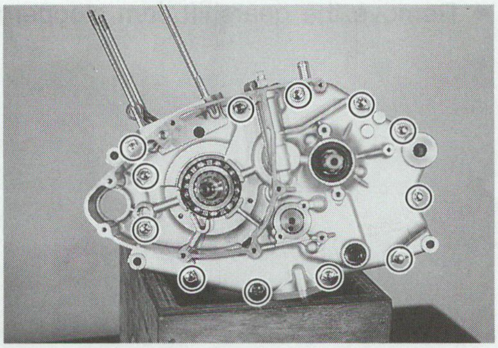
- Remove the oil seal retainer ⑧.
- Remove the spacer ⑨.



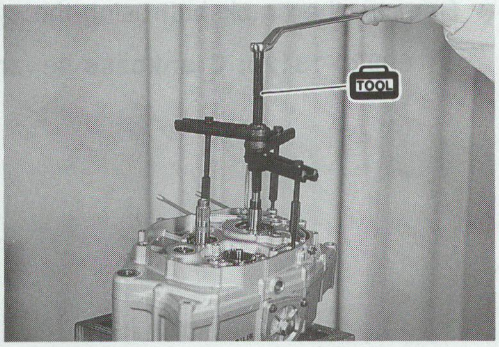
- Remove the neutral cam stopper ⑩.



- Remove the crankcase bolts.



- Separate the left and right crankcases using the special tool.

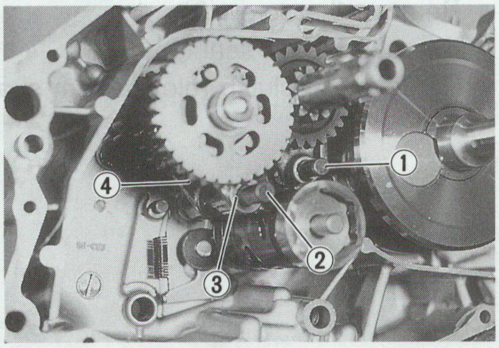


TOOL 09920-13120: Crankcase separator

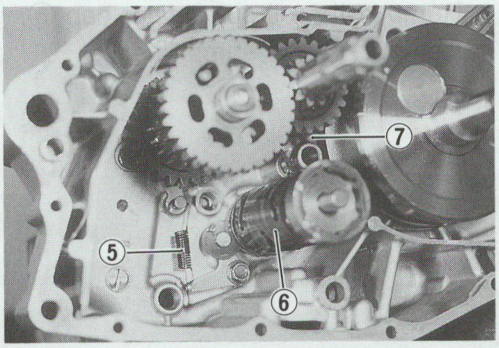
NOTE:

* *Fit the crankcase separator, so that the tool arms are in parallel with the side of crankcase.*
* *The crankshaft and transmission components should remain in the left crankcase half.*
* *When separating the crankcase, tap the end of the countershaft with a plastic mallet.*

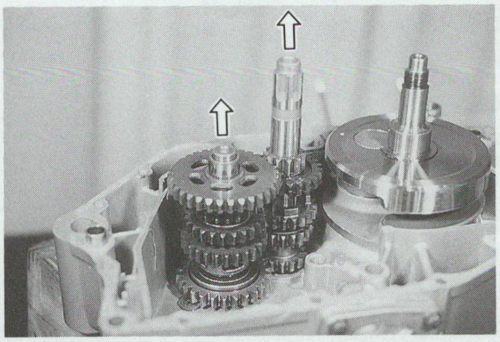
- Remove the gearshift fork shafts (①, ②), gearshift forks (③, ④).



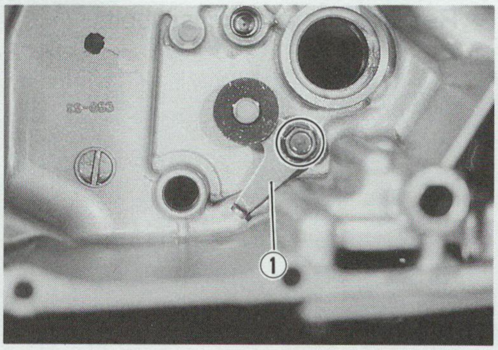
- Remove the gearshift cam stopper spring ⑤.
- Remove the gearshift cam ⑥.
- Remove the gearshift fork ⑦.



- Remove the transmission.

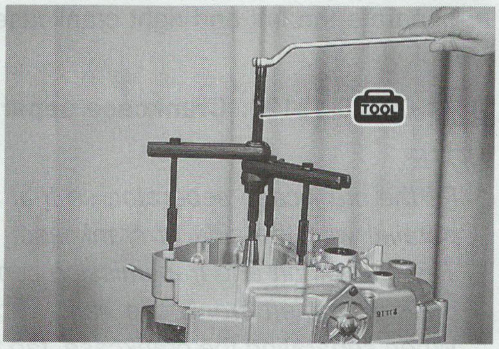


- Remove the gearshift cam stopper ①.

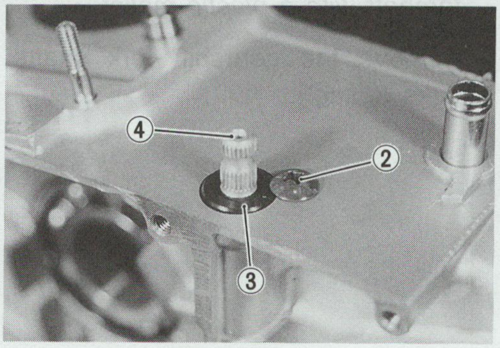


- Remove the crankshaft using the special tool.

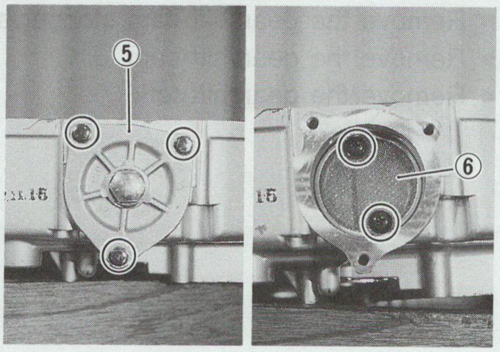
TOOL 09920-13120: Crankcase separator



- Remove the screw ②.
- Remove the oil seal ③.
- Remove the clutch release cam shaft ④.



- Remove the oil sump filter cap ⑤.
- Remove the oil sump filter ⑥.

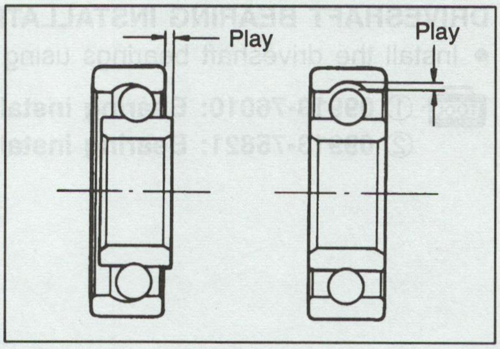


ENGINE COMPONENTS INSPECTION AND SERVICE

CRANKCASE BEARINGS

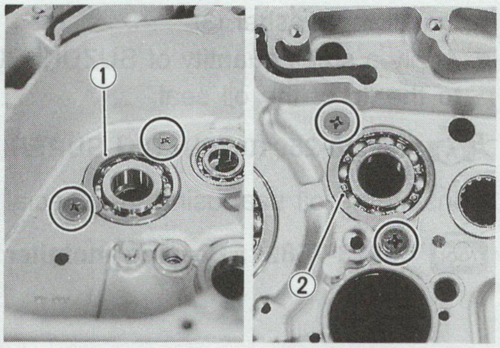
BEARING INSPECTION

While the bearing is in the crankcase, rotate its inner race and check to see that it turns smoothly. If it does not turn quietly and smoothly, or if there are signs of any abnormalities, the bearing is defective and must be replaced as follows.



BEARING REMOVAL

- Remove the bearing retainers (①, ②).



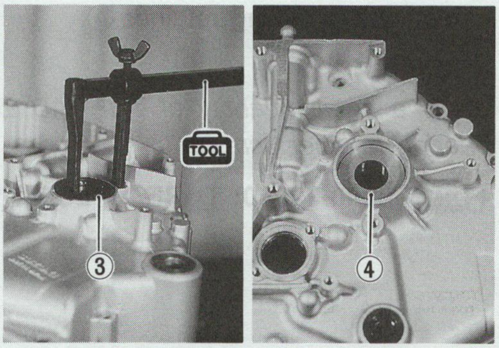
- Remove the oil seal ③ using the special tool.

TOOL 09913-50121: Oil seal remover

▲ CAUTION

The removed oil seal should be replaced with a new one.

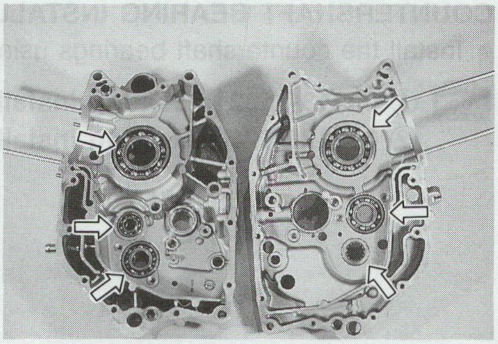
- Remove the washer ④.



- Remove the bearings.

▲ CAUTION

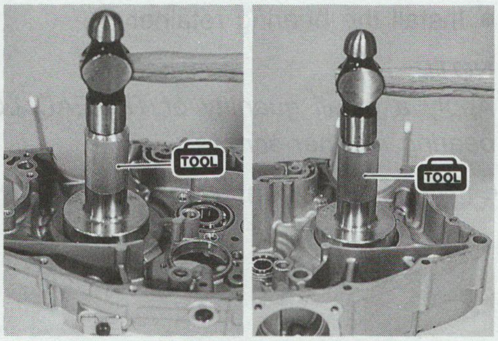
The removed bearings should be replaced with new ones.



CRANKSHAFT BEARING INSTALLATION

- Install the crankshaft bearings using the special tool.

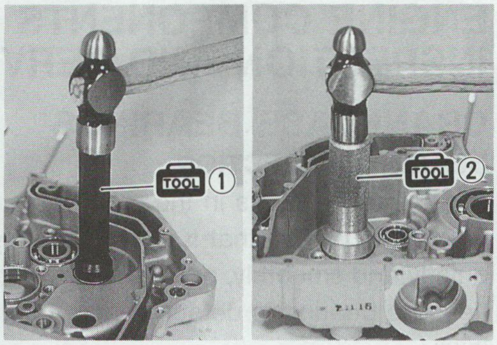
TOOL 09913-75510: Bearing installer



DRIVESHAFT BEARING INSTALLATION

- Install the driveshaft bearings using the special tools.

TOOL **① 09913-76010: Bearing installer**
② 09913-75821: Bearing installer

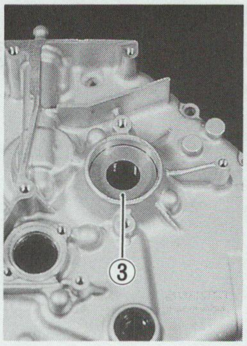


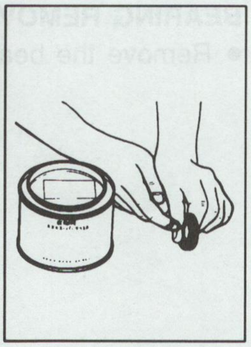
- Install the washer ③.
- Apply a small quantity of SUZUKI SUPER GREASE "A" to the lip of the oil seal.

A **99000-25010: SUZUKI SUPER GREASE "A"**

- Install the oil seal using the special tool.

TOOL **09913-75821: Bearing installer**

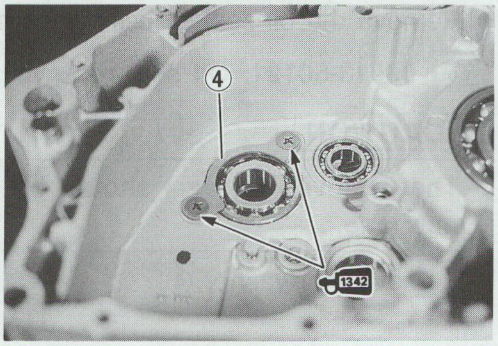




- Install the bearing retainer ④.

NOTE:
Apply a small quantity of THREAD LOCK "1342" to the bearing retainer screws.

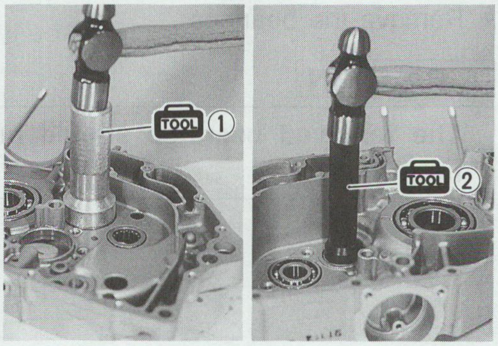
1342 **99000-32050: THREAD LOCK "1342"**



COUNTERSHAFT BEARING INSTALLATION

- Install the countershaft bearings using the special tools.

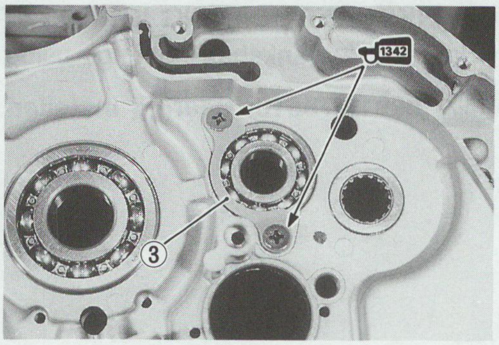
TOOL **① 09913-75821: Bearing installer**
② 09913-76010: Bearing installer



- Install the bearing retainer ③.

NOTE:
Apply a small quantity of THREAD LOCK "1342" to the bearing retainer screws.

1342 **99000-32050: THREAD LOCK "1342"**



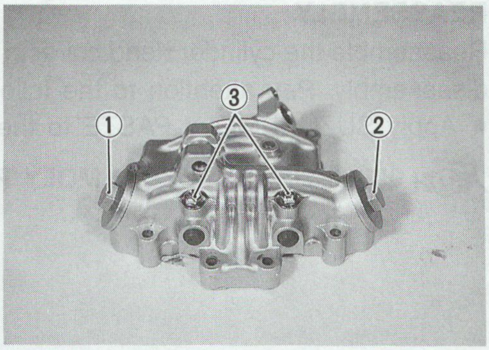
CYLINDER HEAD COVER

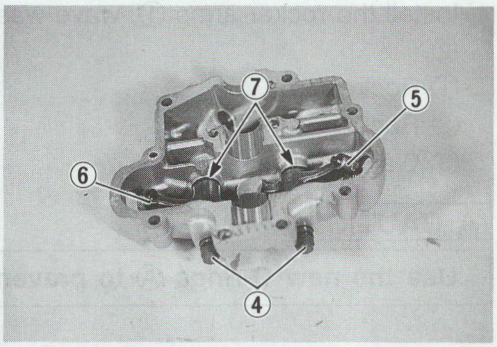
▲ CAUTION

Identify the position of each removed part. Organize the parts in their respective groups (i.e., intake or exhaust) so that they can be installed in their original locations.

DISASSEMBLY

- Remove the valve timing inspection caps (①, ②).
- Remove the rocker arm shaft bolts ③.
- Remove the rocker arm shafts ④.
- Remove the rocker arms (⑤, ⑥) and wave washers ⑦.





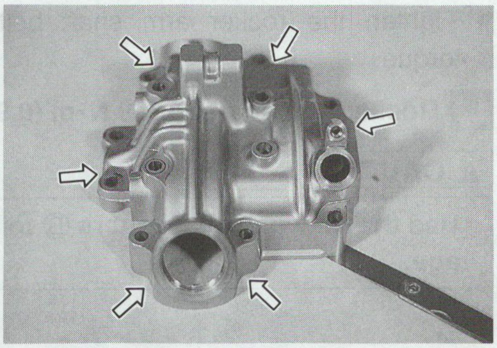
CYLINDER HEAD COVER DISTORTION

After removing the sealant (SUZUKI BOND "1215") from the mating surface of the cylinder head cover, place the cylinder head cover on a surface plate and check for distortion with a thickness gauge. Check points are shown in Fig.

TOOL 09900-20803: Thickness gauge

Service Limit: 0.05 mm (0.002 in)

If the distortion exceeds the limit, replace the cylinder head cover.

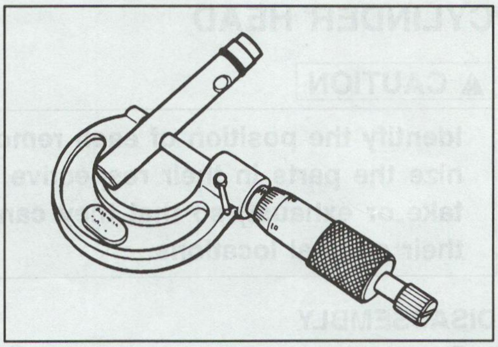


ROCKER ARM SHAFT O.D.

Measure the diameter of the rocker arm shafts.

TOOL 09900-20205: Micrometer (0–25 mm)

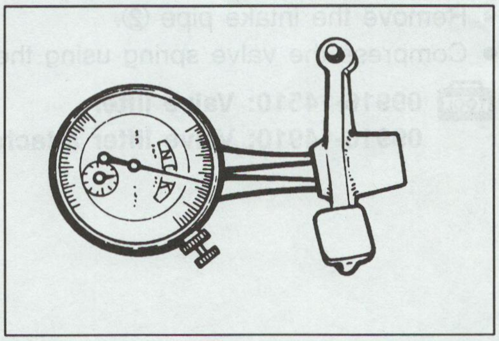
Standard (IN. & EX.):
11.977–11.995 mm (0.4715–0.4722 in)



ROCKER ARM I.D.

Measure the inside diameter of the rocker arm and check the wear of the camshaft contacting surface.

Standard (IN. & EX.):
12.000–12.018 mm (0.4724–0.4731 in)

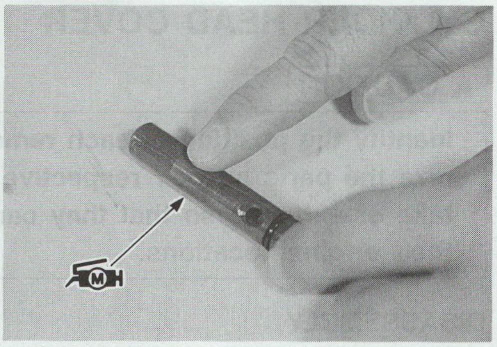


REASSEMBLY

Reassemble the cylinder head cover in the reverse order of disassembly. Pay attention to the following points:

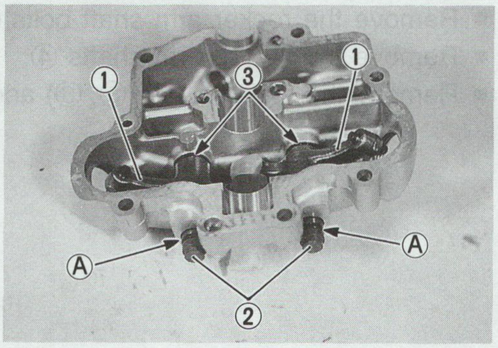
- Apply SUZUKI MOLY PASTE to the rocker arm shafts.

MH 99000-25140: SUZUKI MOLY PASTE



- Install the rocker arms ①, wave washers ③ and shafts ②.

① Rocker arm
② Rocker arm shaft
③ Wave washer

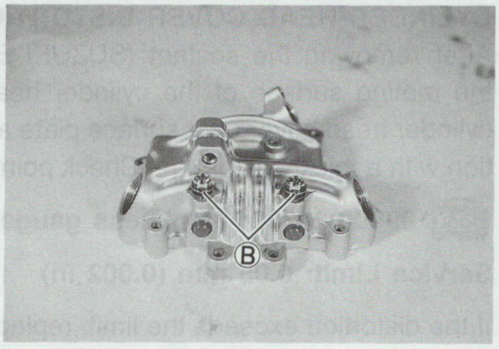


▲ CAUTION

Use the new O-rings Ⓐ to prevent oil leakage.

- Tighten the rocker arm shaft bolts to the specified torque.

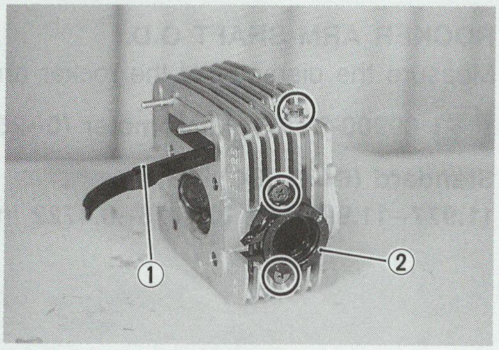
Rocker arm shaft bolt: 9 N·m (0.9 kg-m, 6.5 lb-ft)



▲ CAUTION

Use the new gasket washers Ⓑ to prevent oil leakage.

CYLINDER HEAD



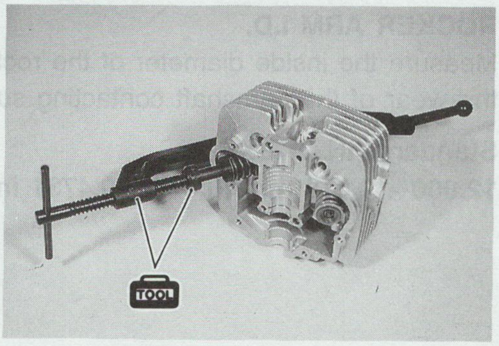
▲ CAUTION

Identify the position of each removed part. Organize the parts in their respective groups (i.e., intake or exhaust) so that they can be installed in their original locations.

DISASSEMBLY

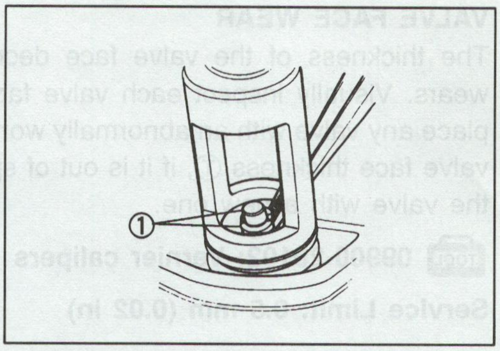
- Remove the cam chain tensioner ①.
- Remove the intake pipe ②.
- Compress the valve spring using the special tools.

TOOL 09916-14510: Valve lifter
09916-14910: Valve lifter attachment

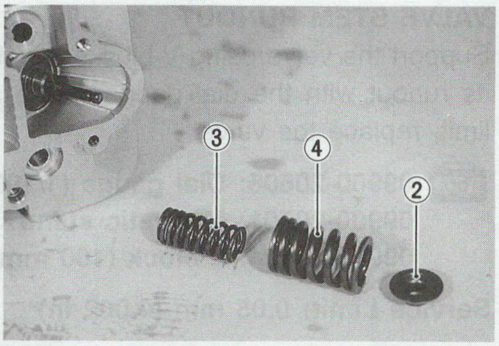


- Remove the valve cotters ① from the valve stem.

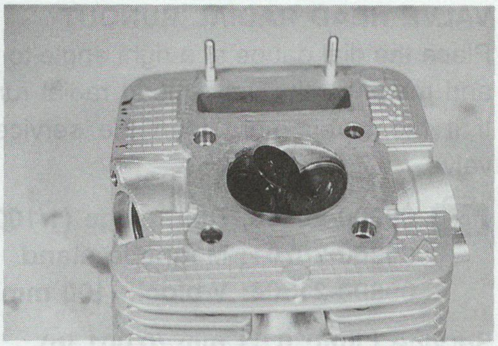
09916-84511: Tweezers



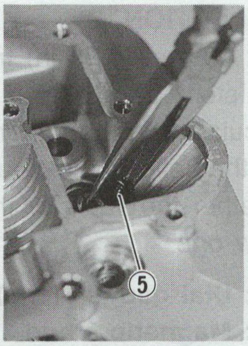
- Remove the valve spring retainer ② and inner and outer valve springs (③, ④).

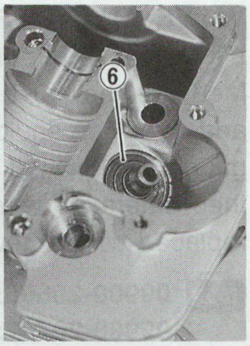


- Remove the valve from the combustion chamber side.



- Remove the valve stem seal ⑤.
- Remove the valve spring seat ⑥.



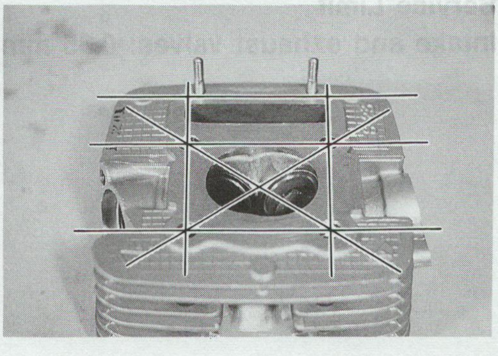


CYLINDER HEAD DISTORTION

Decarbon the combustion chamber.
Check the gasket surface of the cylinder head for distortion using a straightedge and thickness gauge. Take clearance readings at several places. If readings exceed the service limit, replace the cylinder head.

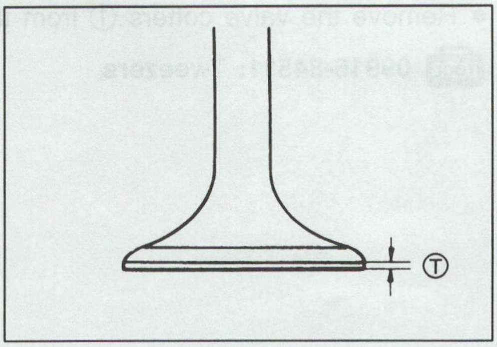
09900-20803: Thickness gauge

Service Limit: 0.05 mm (0.002 in)



VALVE FACE WEAR

The thickness of the valve face decreases as the face wears. Visually inspect each valve face for wear and replace any valve with an abnormally worn face. Measure the valve face thickness Ⓣ, if it is out of specification, replace the valve with a new one.

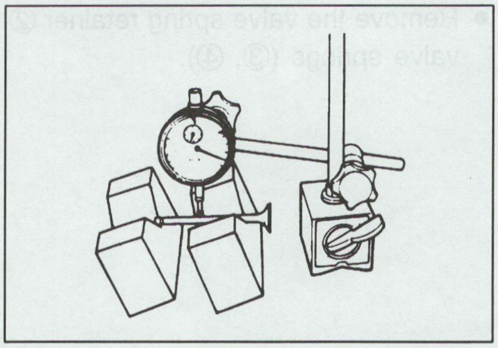


TOOL 09900-20102: Vernier calipers

Service Limit: 0.5 mm (0.02 in)

VALVE STEM RUNOUT

Support the valve using V-blocks, as shown, and measure its runout with the dial gauge. If the runout exceeds the limit, replace the valve.

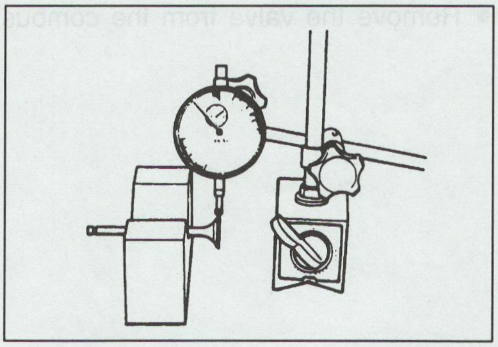


TOOL 09900-20606: Dial gauge (1/100 mm)
09900-20701: Magnetic stand
09900-21304: V-block (100 mm)

Service Limit: 0.05 mm (0.002 in)

VALVE HEAD RADIAL RUNOUT

Place the dial gauge at a right angle to the valve head face and measure the valve head radial runout.
If it measures more than the service limit, replace the valve.

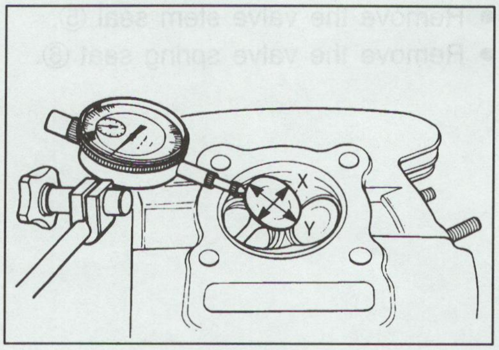


TOOL 09900-20606: Dial gauge (1/100 mm)
09900-20701: Magnetic stand
09900-21304: V-block (100 mm)

Service Limit: 0.03 mm (0.001 in)

VALVE STEM DEFLECTION

Lift the valve about 10 mm (0.39 in) from the valve seat. Measure the valve stem deflection in two directions, "X" and "Y", perpendicular to each other. Position the dial gauge as shown. If the deflection exceeds the service limit, then determine whether the valve or the guide should be replaced with a new one.

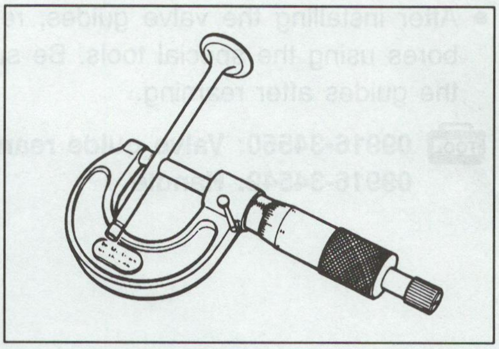


TOOL 09900-20606: Dial gauge (1/100 mm)
09900-20701: Magnetic stand

Service Limit
Intake and exhaust valves: 0.35 mm (0.014 in)

VALVE STEM WEAR

Measure the valve stem O.D. using the micrometer. If it is out of specification, replace the valve with a new one. If the valve stem O.D. is within specification but the valve stem deflection is not, replace the valve guide. After replacing the valve or valve guide, re-check the deflection.



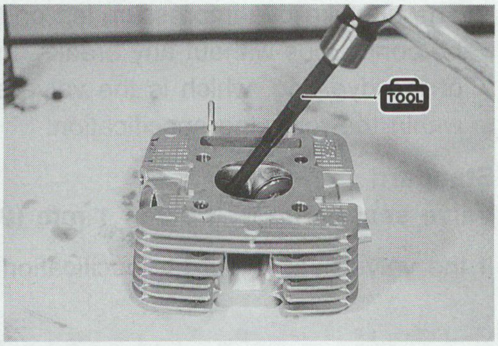
TOOL 09900-20205: Micrometer (0–25 mm)

Standard
Valve stem O.D.
IN.: 5.475–5.490 mm (0.2156–0.2161 in)
EX.: 5.455–5.470 mm (0.2148–0.2154 in)

NOTE:
If valve guides have to be replaced, refer to the valve guide servicing steps below.

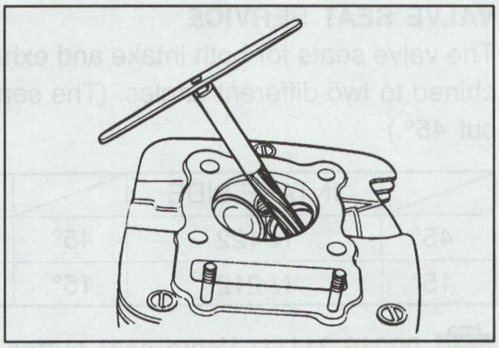
VALVE GUIDE SERVICE

- Remove the valve guide using the special tool.



TOOL 09916-44910: Valve guide remover/installer

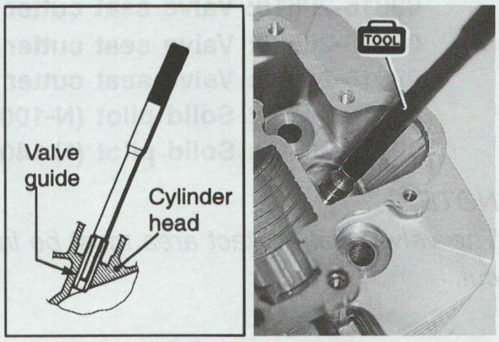
NOTE:
- * *Discard the removed valve guide subassemblies.*
- * *Only oversized valve guides are available as replacement parts.*



- Re-finish the valve guide holes in the cylinder head using the special tools.

TOOL 09916-34561: Valve guide reamer (11.3 mm)
09916-34542: Handle

NOTE:
Insert the reamer from the combustion chamber side and always turn the reamer handle clockwise.



- Install a ring onto each valve guide.
- Oil the stem hole of each valve guide and drive the guide into the guide hole using the special tool.

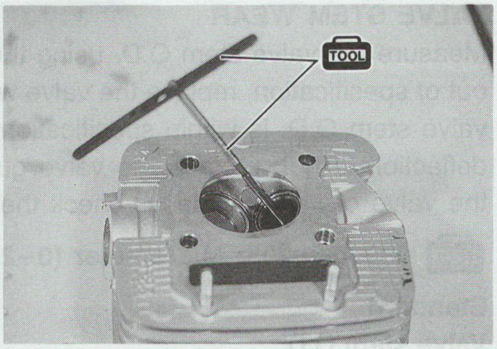
TOOL 09916-44910: Valve guide remover/installer

⚠ CAUTION

Be sure to use a new valve guide ring and valve guide.

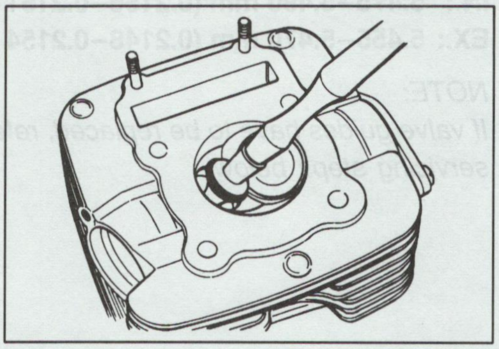
- After installing the valve guides, re-finish their guiding bores using the special tools. Be sure to clean and oil the guides after reaming.

TOOL **09916-34550: Valve guide reamer (5.5 mm)**
09916-34542: Handle



VALVE SEAT WIDTH

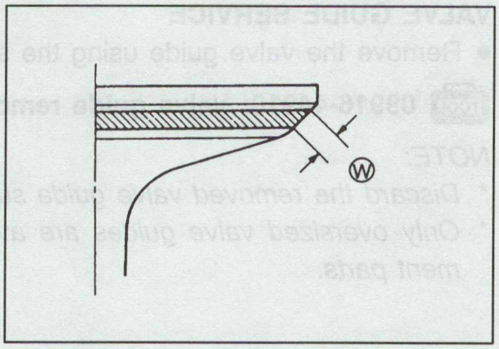
- Coat the valve seat uniformly with Prussian blue. Install the valve and attach a valve lapper onto it. Tap the coated seat with the valve face in a rotating manner, in order to obtain a clear impression of the seating contact.



- The ring-like dye impression left on the valve face must be continuous without any breaks. In addition, the width of the dye ring, which is the valve seat width, must be within the following specification:

Standard
Valve seat width Ⓦ : 0.9–1.1 mm (0.035–0.043 in)

If the valve seat is out of specification, re-cut the seat.



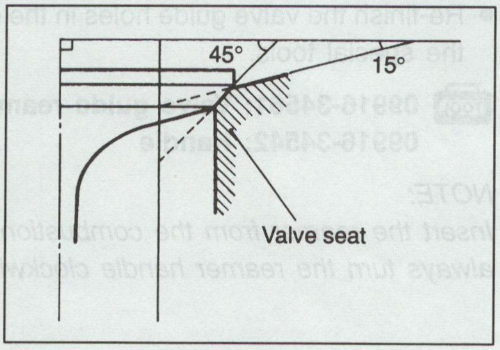
VALVE SEAT SERVICE

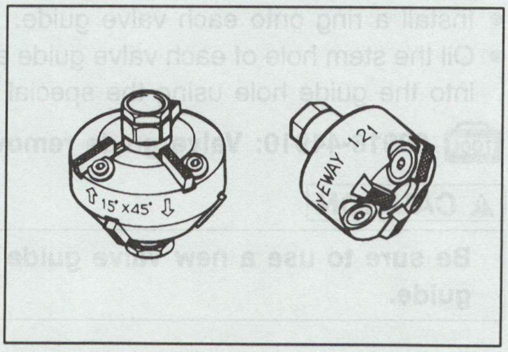
The valve seats for both intake and exhaust valves are machined to two different angles. (The seat contact surface is cut 45°.)

	INTAKE SIDE		EXHAUST SIDE
45°	N-122	45°	N-122
15°	N-212	15°	N-121

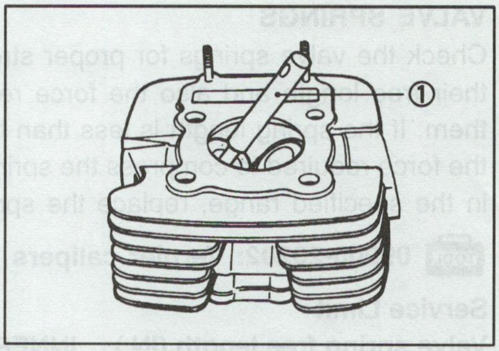
TOOL **09916-21111: Valve seat cutter set**
09916-20610: Valve seat cutter (N-121)
09916-20620: Valve seat cutter (N-122)
09916-24910: Valve seat cutter (N-212)
09916-24450: Solid pilot (N-100-5.52)
09916-24480: Solid pilot (N-140-5.5)

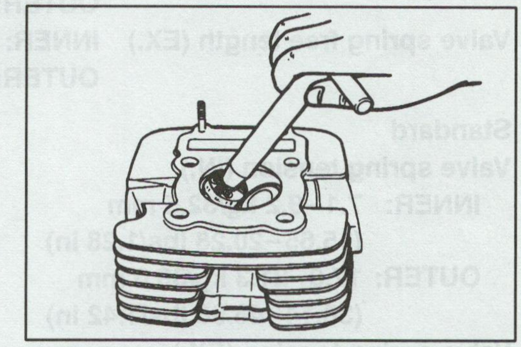
NOTE:
The valve seat contact area must be inspected after each cut.





- When installing the solid pilot ①, rotate it slightly. Seat the pilot snugly. Install the 45° cutter, attachment and T-handle.
- Using the 45° cutter, descale and clean up the seat. Rotate the cutter one or two turns.
- Measure the valve seat width after every cut. If the valve seat is pitted or burned, use the 45° cutter to condition the seat same more.

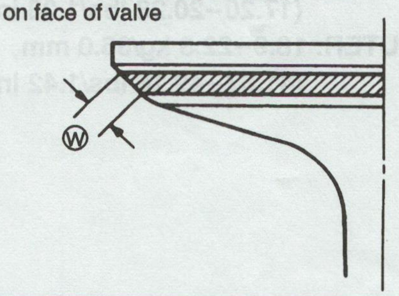




NOTE:
Cut only the minimum amount necessary from the seat to prevent the possibility of the valve stem becoming too close to the rocker arm for correct valve contact angle.

If the contact area is too high on the valve, or if it is too wide, use the 15° cutter to lower and narrow the contact area.

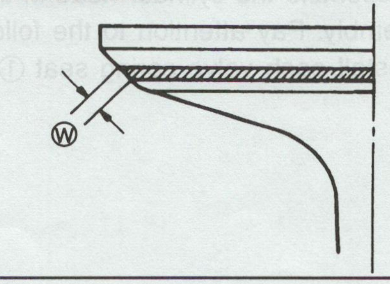
Contact area too high and too wide on face of valve



If the contact area is too low or too narrow, use the 45° cutter to raise and widen the contact area.

- After the desired seat position and width is achieved, use the 45° cutter very lightly to clean up any burrs caused by the previous cutting operations.

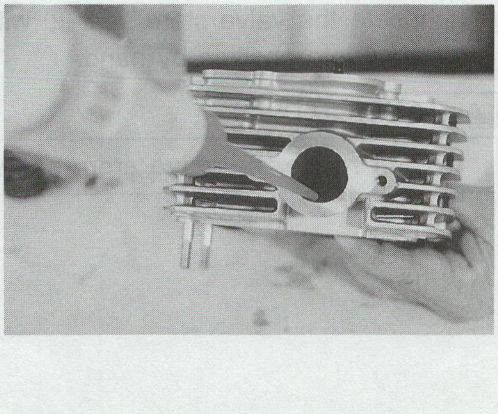
Contact area too low and too narrow on face of valve



▲ CAUTION

DO NOT use lapping compound after the final cut is made. The finished valve seat should have a velvety smooth finish and not a highly polished or shiny finish. This will provide a soft surface for the final seating of the valve which will occur during the first few seconds of engine operation.

- Clean and assemble the head and valve components. Fill the intake and exhaust ports with gasoline to check for leaks. If any leaks occur, inspect the valve seat and face for burrs or other things that could prevent the valve from sealing.



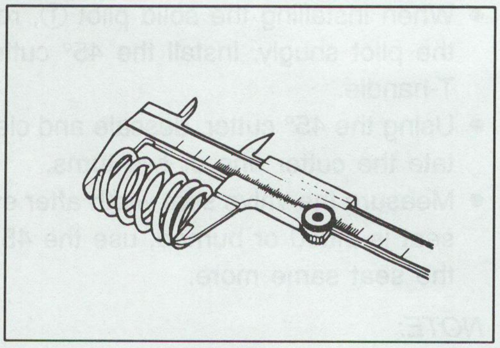
▲WARNING

Always use extreme caution when handling gasoline.

NOTE:
After servicing the valve seats, be sure to check the valve clearance after the cylinder has been reinstalled. (See pp. 2-3 and -4.)

VALVE SPRINGS

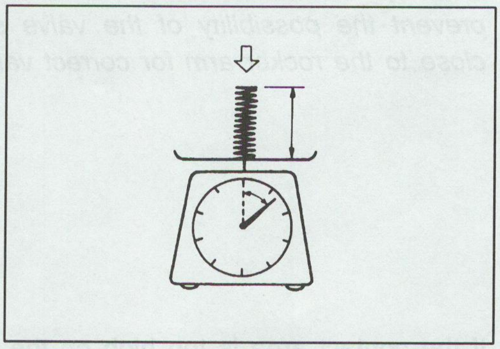
Check the valve springs for proper strength by measuring their free length and also the force required to compress them. If the spring length is less than the service limit or if the force required to compress the spring does not fall within the specified range, replace the spring.



TOOL 09900-20202: Vernier calipers

Service Limit

Valve spring free length (IN.)	**INNER: 35.1 mm (1.38 in)** **OUTER: 39.9 mm (1.57 in)**
Valve spring free length (EX.)	**INNER: 36.0 mm (1.42 in)** **OUTER: 39.3 mm (1.55 in)**



Standard

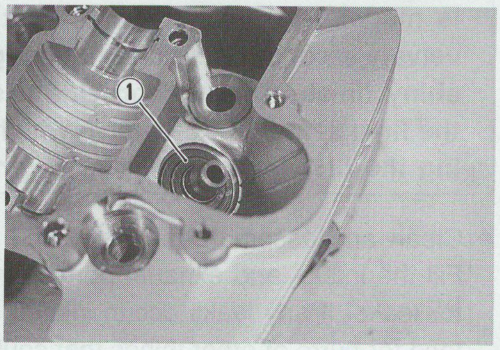
Valve spring tension (IN.)
INNER: 7.1–9.2 kg/32.5 mm
(15.65–20.28 lbs/1.28 in)
OUTER: 17.3–21.3 kg/36.0 mm
(38.14–46.96 lbs/1.42 in)

Valve spring tension (EX.)
INNER: 7.8–9.2 kg/32.5 mm
(17.20–20.28 lbs/1.28 in)
OUTER: 18.9–22.3 kg/36.0 mm
(41.67–49.16 lbs/1.42 in)

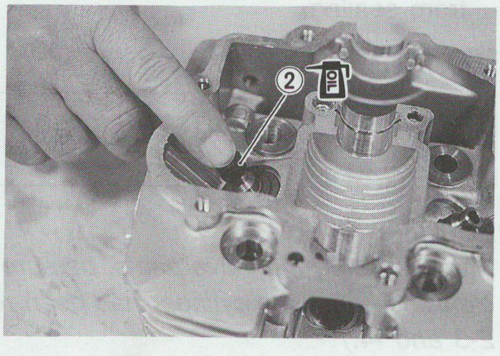
REASSEMBLY

Reassemble the cylinder head in the reverse order of disassembly. Pay attention to the following points:

- Install each valve spring seat ①.



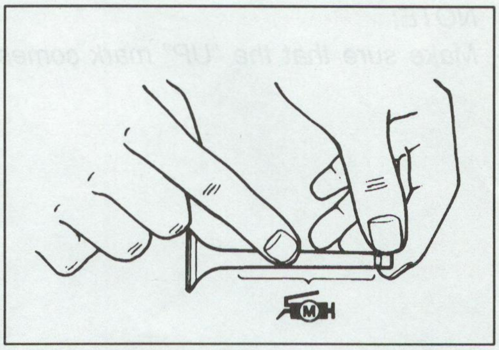
- Lubricate the valve stem seal ② with oil, and press-fit the seal into position by hand.



⚠ CAUTION

Do not reuse the valve stem seals.

- Insert the valves with their stems coated with high quality molybdenum disulfide lubricant (SUZUKI MOLY PASTE). Coat the entire stem making sure that there are no gaps.
  Also, be sure to oil the valve stem seal lip.

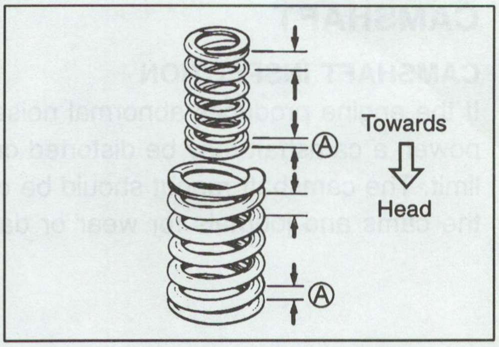


99000-25140: SUZUKI MOLY PASTE

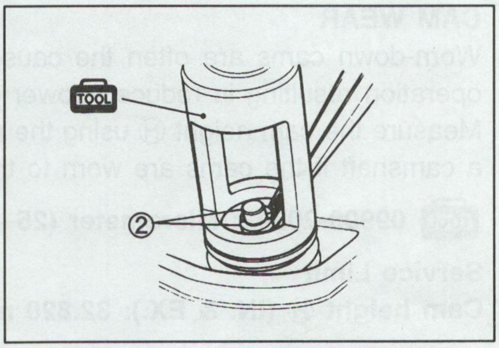
▲ CAUTION

When inserting each valve, take care not to damage the lip of the stem seal.

- Install the valve springs with the smaller pitch Ⓐ facing the cylinder head.



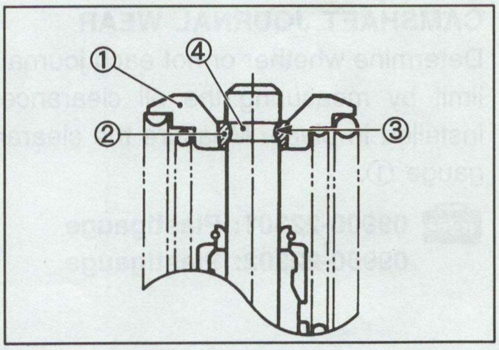
- Install the valve spring retainer ①, press down the spring using the valve lifter and then install the cotter halves onto the valve stem end. Then, release the valve lifter to allow the cotter ② to wedge between the retainer and the valve stem. Be sure that the rounded lip ③ of the cotter fits snugly into the groove ④ in the stem end.



09916-14510: Valve lifter
09916-14910: Valve lifter attachment
09916-84511: Tweezers

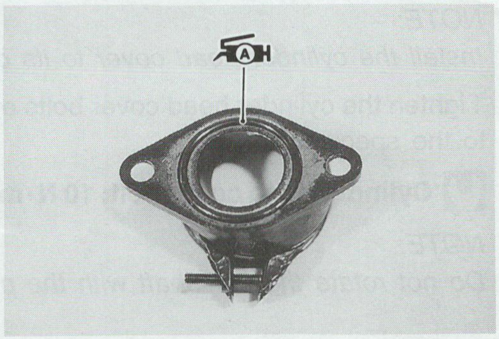
▲ CAUTION

Be sure to install all of the parts in their original positions.



INTAKE PIPE

- When installing the intake pipe, apply grease to the O-ring.

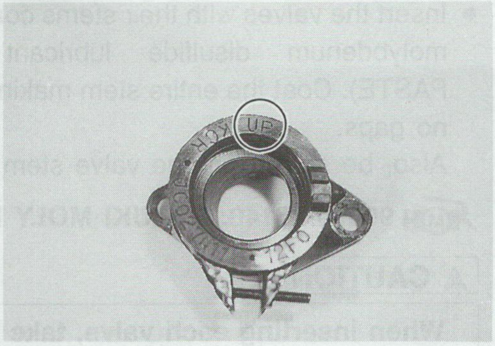


99000-25010: SUZUKI SUPER GREASE "A"

▲ CAUTION

Use the new O-ring to prevent sucking air from the joint.

NOTE:
Make sure that the "UP" mark comes upward.



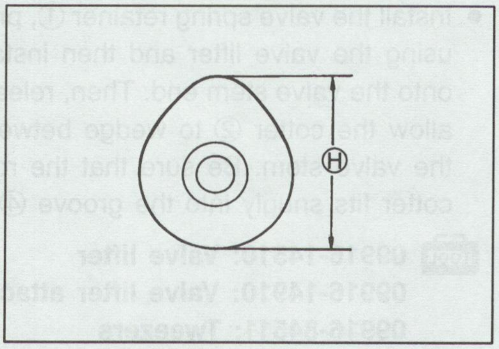
CAMSHAFT

CAMSHAFT INSPECTION

If the engine produces abnormal noises, vibration or lacks power, a camshaft may be distorted or worn to the service limit. The camshaft runout should be checked. Also, check the cams and journals for wear or damage.

CAM WEAR

Worn-down cams are often the cause of mistimed valve operation resulting in reduced power output.
Measure the cam height Ⓗ using the micrometer. Replace a camshaft if the cams are worn to the service limit.

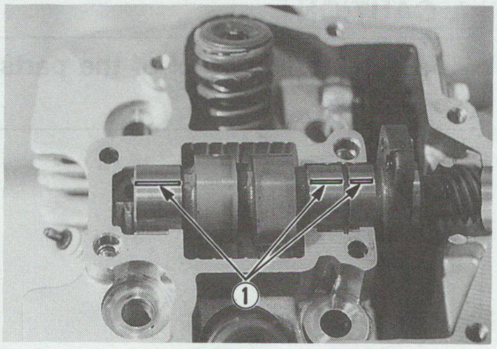


TOOL 09900-20202: Micrometer (25–50 mm)

Service Limit
Cam height Ⓗ (IN. & EX.): 32.820 mm (1.2921 in)

CAMSHAFT JOURNAL WEAR

Determine whether or not each journal is worn down to the limit by measuring the oil clearance with the camshaft installed in place. Measure the clearance using the plastigauge ①.



TOOL 09900-22301: Plastigauge
09900-22302: Plastigauge

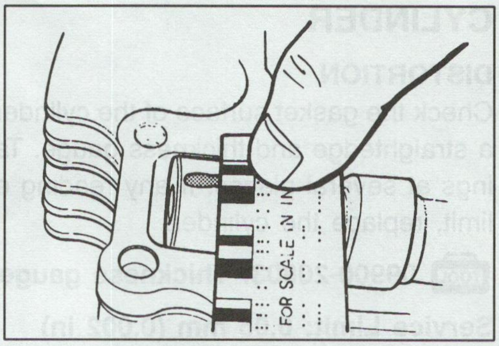
NOTE:
Install the cylinder head cover to its original position.

Tighten the cylinder head cover bolts evenly and diagonally to the specified torque.

Cylinder head cover bolt: 10 N·m (1.0 kg-m, 7.0 lb-ft)

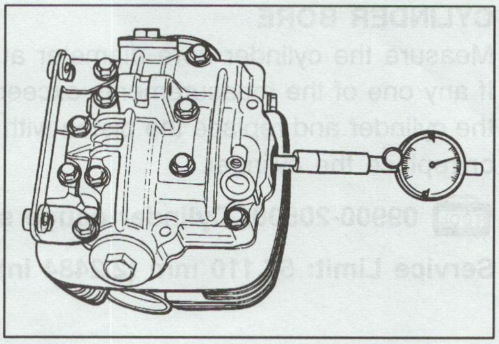
NOTE:
Do not rotate the camshaft with the plastigauge in place.

Remove the cylinder head cover and measure the width of the compressed plastigauge using the envelope scale. This measurement should be taken at the widest part of the compressed plastigauge.



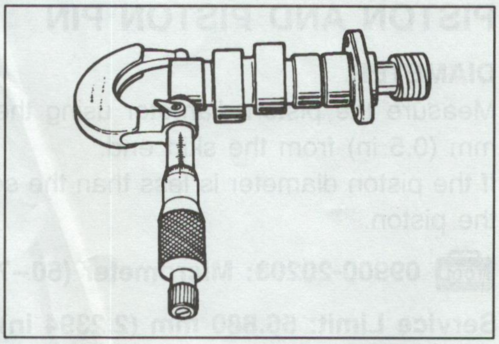
Service Limit
Camshaft-Journal oil clearance (IN & EX): 0.150 mm (0.0059 in)

If the camshaft journal oil clearance exceeds the limit, measure the inside diameter of the camshaft journal holder and outside diameter of the camshaft journal. Replace the camshaft or the cylinder head depending upon which one exceeds the specification.



TOOL 09900-22403: Small bore gauge

Standard
Camshaft journal holder I.D. (IN & EX): 22.012–22.025 mm (0.8666–0.8671 in)

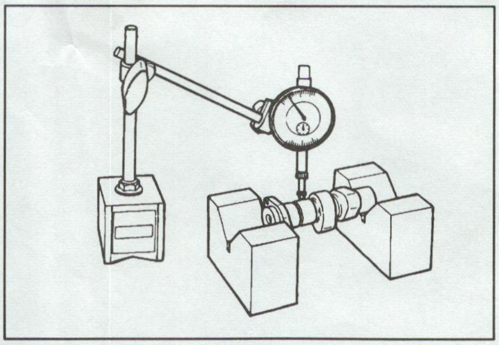


TOOL 09900-20205: Micrometer (0–25 mm)

Standard
Camshaft journal O.D. (IN & EX): 21.959–21.980 mm (0.8645–0.8654 in)

CAMSHAFT RUNOUT

Measure the runout using a dial gauge. Replace the camshaft if the runout exceeds the limit.

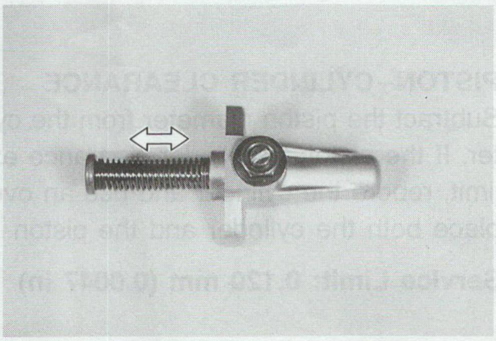


TOOL 09900-20606: Dial gauge (1/100 mm)
09900-20701: Magnetic stand
09900-21304: V-block set (100 mm)

Service Limit
Camshaft runout (IN & EX): 0.10 mm (0.004 in)

CAM CHAIN TENSION ADJUSTER

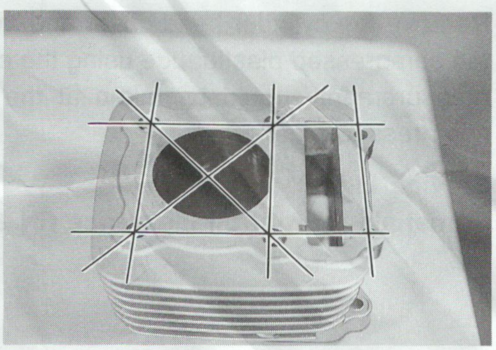
Make sure the push rod movement. If the push rod is stuck or spring mechanism failed, replace the cam chain tension adjuster assembly with a new one.



CYLINDER

DISTORTION

Check the gasket surface of the cylinder for distortion using a straightedge and thickness gauge. Take clearance readings at several places. If any reading exceeds the service limit, replace the cylinder.

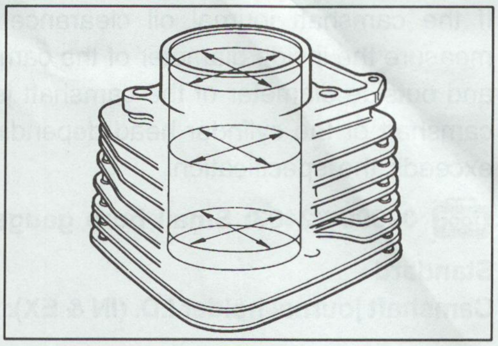


TOOL **09900-20803: Thickness gauge**

Service Limit: 0.05 mm (0.002 in)

CYLINDER BORE

Measure the cylinder bore diameter at six places.
If any one of the measurements exceed the limit, overhaul the cylinder and replace the piston with an oversize piston, or replace the cylinder.



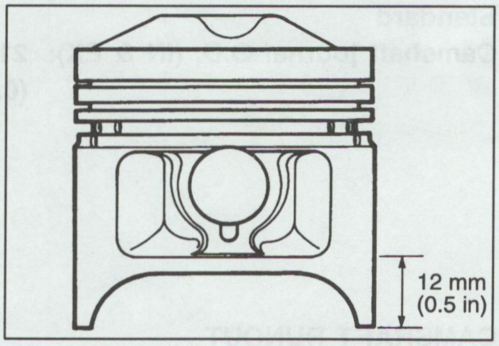
TOOL **09900-20508: Cylinder gauge set**

Service Limit: 57.110 mm (2.2484 in)

PISTON AND PISTON PIN

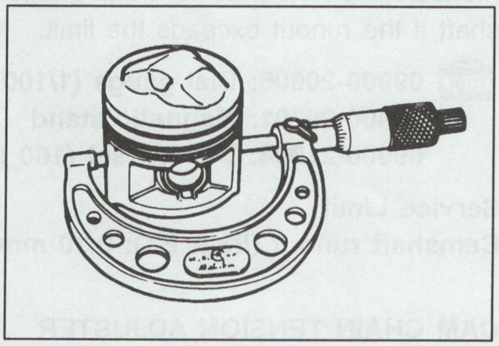
DIAMETER

Measure the piston diameter using the micrometer at 12 mm (0.5 in) from the skirt end.
If the piston diameter is less than the service limit, replace the piston.



TOOL **09900-20203: Micrometer (50–75 mm)**

Service Limit: 56.880 mm (2.2394 in)
Piston oversize: 0.5, 1.0 mm

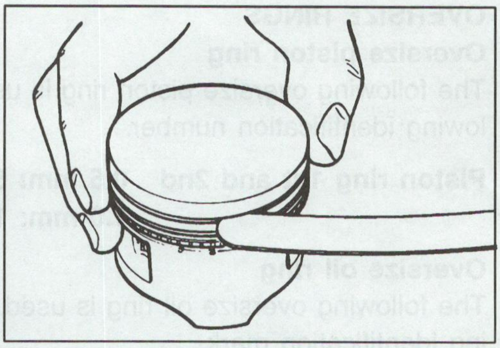


PISTON–CYLINDER CLEARANCE

Subtract the piston diameter from the cylinder bore diameter. If the piston-to-cylinder clearance exceeds the service limit, rebore the cylinder and use an oversize piston or replace both the cylinder and the piston.

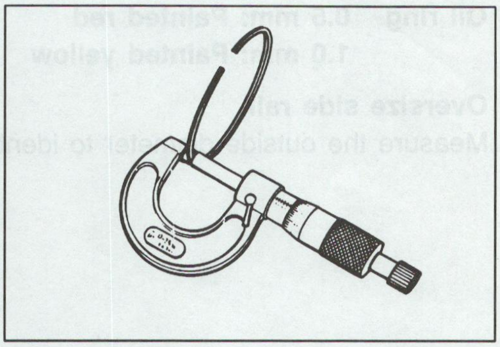
Service Limit: 0.120 mm (0.0047 in)

PISTON RING–GROOVE CLEARANCE



Measure the side clearance of the 1st and 2nd rings using the thickness gauge If any of the clearances exceed the limit, replace both the piston and piston rings.

TOOL **09900-20803: Thickness gauge**
09900-20205: Micrometer (0–25 mm)



Service Limit

Piston ring–groove clearance 1st: 0.180 mm
(0.0071 in)
2nd: 0.150 mm
(0.0059 in)

Standard

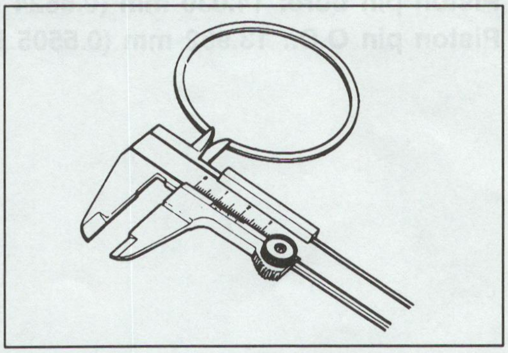
Piston ring groove width 1st: 1.21–1.23 mm
(0.047–0.048 in)
2nd: 1.21–1.23 mm
(0.047–0.048 in)
Oil: 2.51–2.53 mm
(0.099–0.100 in)

Standard

Piston ring thickness 1st: 1.175–1.190 mm
(0.0463–0.0469 in)
2nd: 1.170–1.190 mm
(0.0461–0.0469 in)

NOTE:
Remove any carbon from the piston crown and ring grooves using a soft-metal scraper.

PISTON RING FREE END GAP AND PISTON RING END GAP



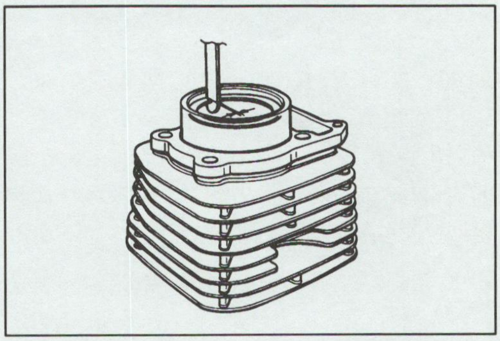
Measure the piston ring free end gap using a vernier calipers. Next, fit the piston ring squarely into the cylinder and measure the piston ring end gap using a thickness gauge. If the piston ring's end gap is out of specification, replace the piston ring.

TOOL **09900-20102: Vernier calipers**

Service Limit

Piston ring free end gap 1st: 5.6 mm (0.22 in)
2nd: 6.8 mm (0.27 in)

TOOL **09900-20803: Thickness gauge**



Service Limit

Piston ring end gap 1st and 2nd: 0.50 mm (0.020 in)

OVERSIZE RINGS

Oversize piston ring

The following oversize piston ring is used. It bears the following identification number.

Piston ring 1st and 2nd 0.5 mm: 50
1.0 mm: 100

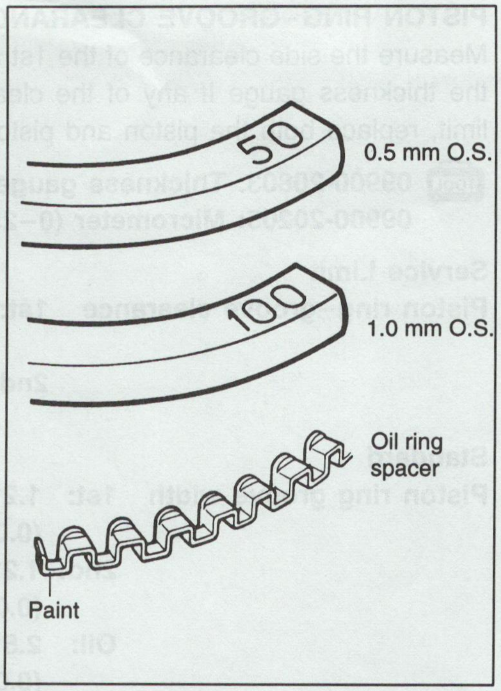
Oversize oil ring

The following oversize oil ring is used. It bears the following identification mark.

Oil ring 0.5 mm: Painted red
1.0 mm: Painted yellow

Oversize side rail

Measure the outside diameter to identify the side.

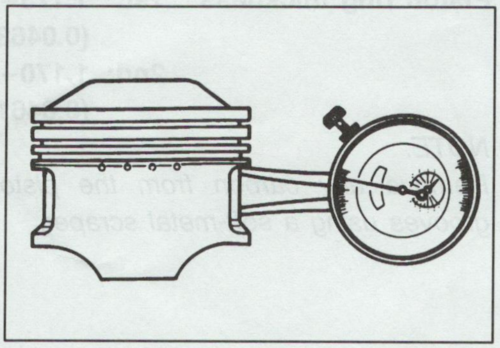


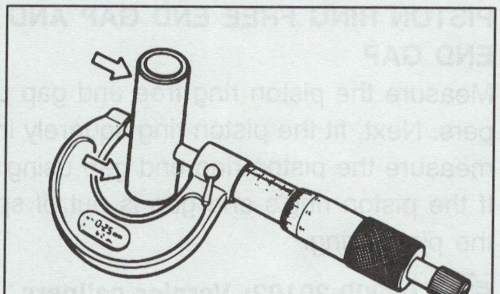
PIN BORE

Measure the piston pin bore inside diameter using the caliper gauge and measure the piston pin outside diameter using the micrometer. If either is out of specification or the difference between these two measurements is more than the limits, replace both piston and piston pin.

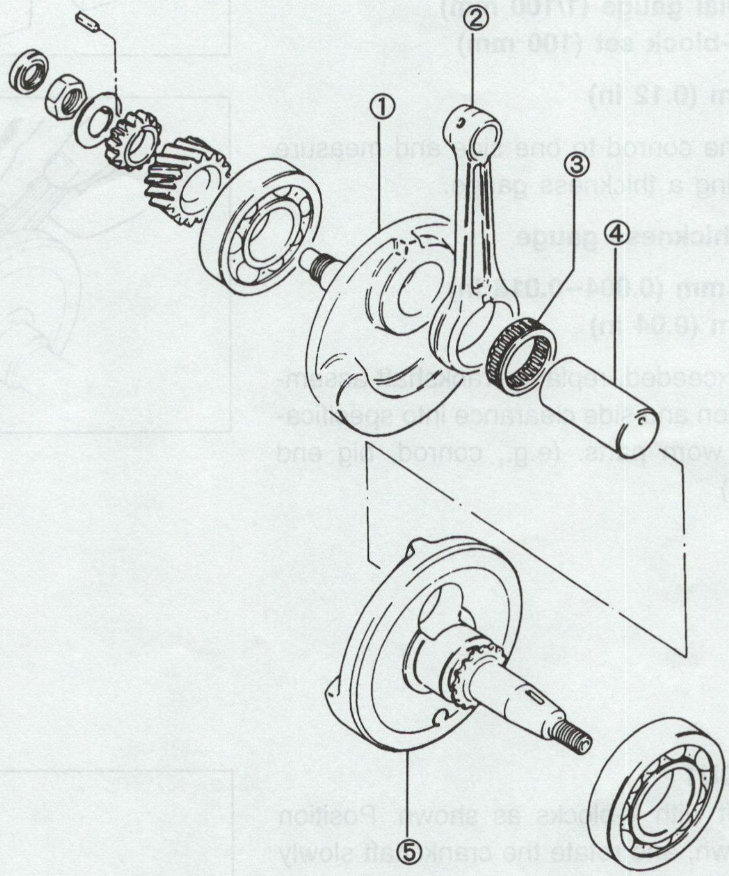
TOOL 09900-20605: Dial calipers
09900-20205: Micrometer (0–25 mm)

Service Limit
Piston pin bore: 14.030 mm (0.5524 in)
Piston pin O.D.: 13.982 mm (0.5505 in)





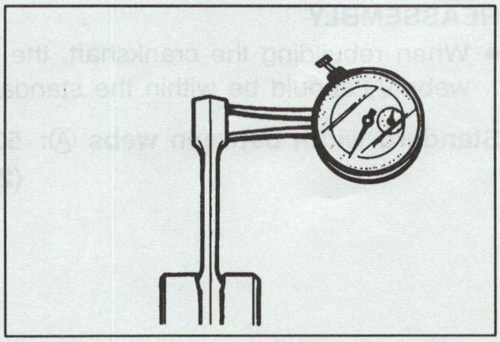
CRANKSHAFT AND CONROD



① Crankshaft, RH
② Conrod
③ Bearing
④ Crank pin
⑤ Crankshaft, LH

CONROD SMALL END I.D.

Measure the conrod small end inside diameter using the dial calipers. If the conrod small end inside diameter exceeds the service limit, replace the conrod.



TOOL **09900-20605: Dial calipers**

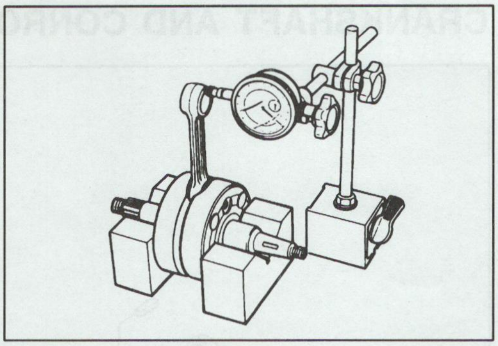
Service Limit: 14.040 mm (0.5528 in)

CONROD DEFLECTION AND CONROD BIG END SIDE CLEARANCE

Wear on the big end of the conrod can be estimated by checking the movement of the small end of the rod. This method can also check the extent of wear on the parts of the conrod's big end.

TOOL **09900-20701: Magnetic stand**
09900-20606: Dial gauge (1/100 mm)
09900-21304: V-block set (100 mm)

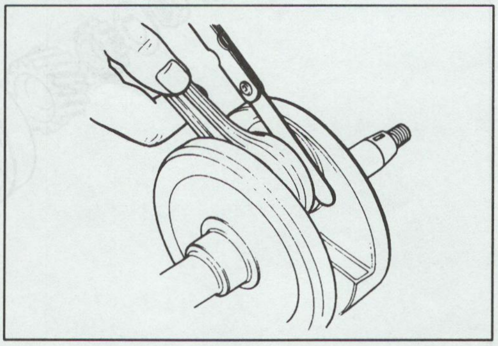
Service Limit: 3.0 mm (0.12 in)



Push the big end of the conrod to one side and measure the side clearance using a thickness gauge.

TOOL **09900-20803: Thickness gauge**

Standard: 0.10–0.45 mm (0.004–0.018 in)
Service Limit: 1.0 mm (0.04 in)



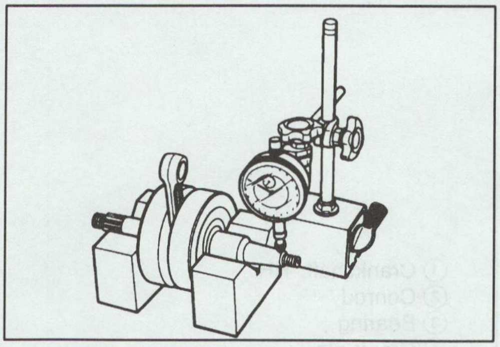
If the service limit is exceeded, replace crankshaft assembly or bring the deflection and side clearance into specification by replacing the worn parts. (e.g., conrod, big end bearing and crank pin)

CRANKSHAFT RUNOUT

Support the crankshaft with V-blocks as shown. Position the dial gauge, as shown, and rotate the crankshaft slowly to read the runout. Correct the runout or replace the crankshaft assembly if the runout is greater than the service limit.

TOOL **09900-20701: Magnetic stand**
09900-20606: Dial gauge (1/100 mm)
09900-21304: V-block set (100 mm)

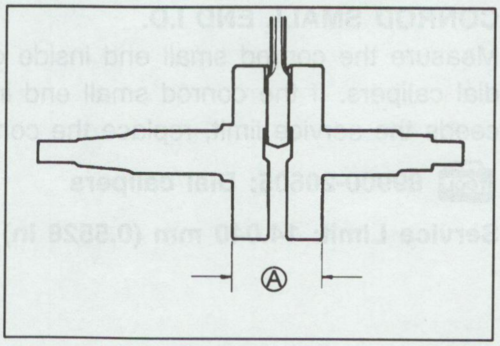
Service Limit: 0.05 mm (0.002 in)



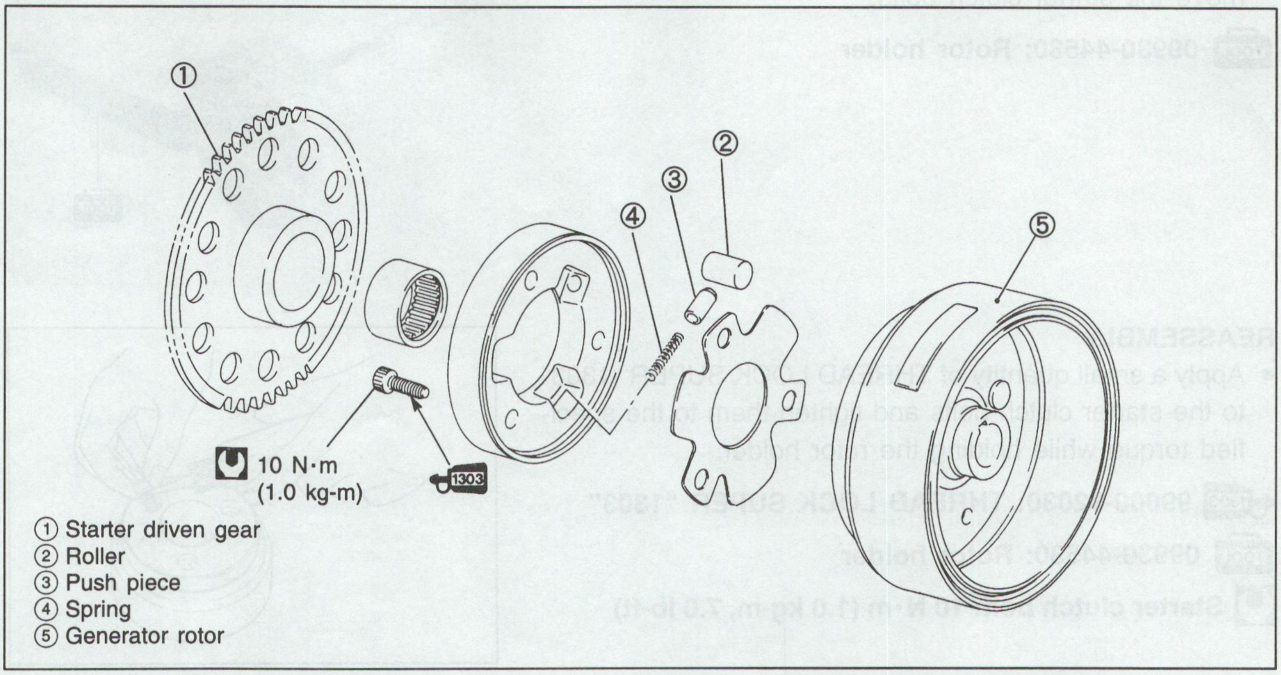
REASSEMBLY

- When rebuilding the crankshaft, the width between the webs Ⓐ should be within the standard range.

Standard width between webs Ⓐ: 53.0 ± 0.1 mm
(2.087 ± 0.004 in)

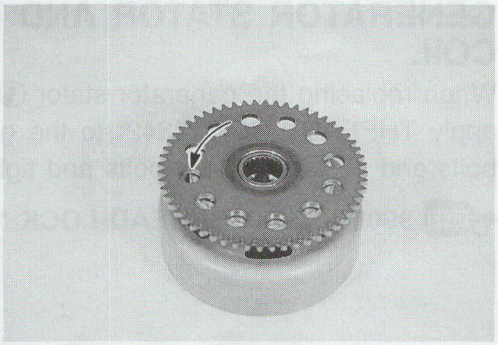


STARTER CLUTCH AND STARTER DRIVEN GEAR BEARING



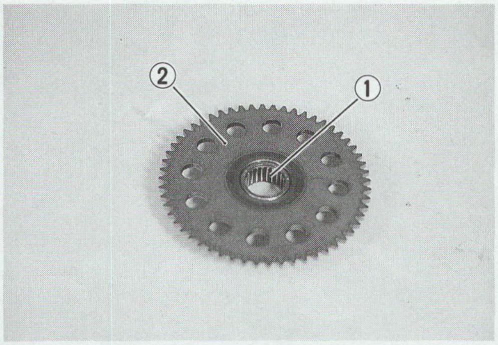
STARTER CLUTCH

Install the starter driven gear onto the starter clutch and turn the starter driven gear by hand (the gear turns in only one direction). The starter driven gear should turn smoothly. If excessive resistance is felt while turning the starter driven gear, inspect the starter clutch. Also, inspect the surface of the starter driven gear which contacts the starter clutch, for wear or damage. If any wear or damage is found, replace the defective part(-s).



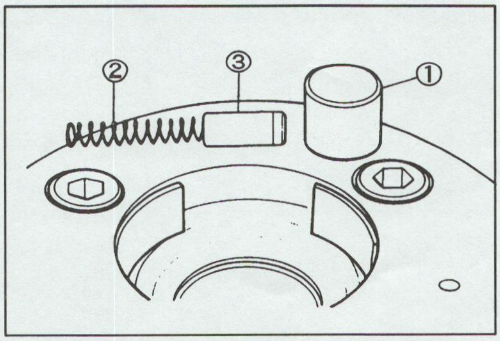
STARTER DRIVEN GEAR BEARING

Install the starter driven gear bearing ① and gear ② onto the crankshaft and turn the starter driven gear by hand. Inspect the starter driven gear bearing for smooth rotation and any abnormal noise. If the bearing does not turn smoothly or there is any abnormal noise, replace it.



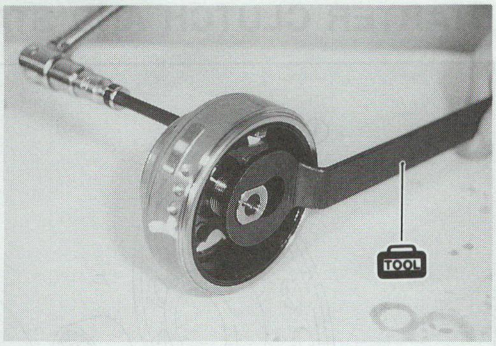
DISASSEMBLY

- Remove the starter driven gear.
- Remove the roller ①, spring ② and push piece ③.



- Hold the generator rotor with the rotor holder and remove the starter clutch bolts.

TOOL 09930-44530: Rotor holder



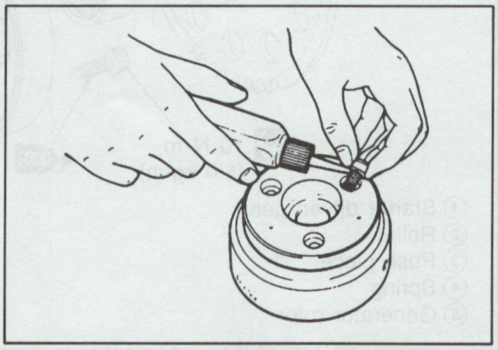
REASSEMBLY

- Apply a small quantity of THREAD LOCK SUPER "1303" to the starter clutch bolts and tighten them to the specified torque while holding the rotor holder.

1303 99000-32030: THREAD LOCK SUPER "1303"

TOOL 09930-44530: Rotor holder

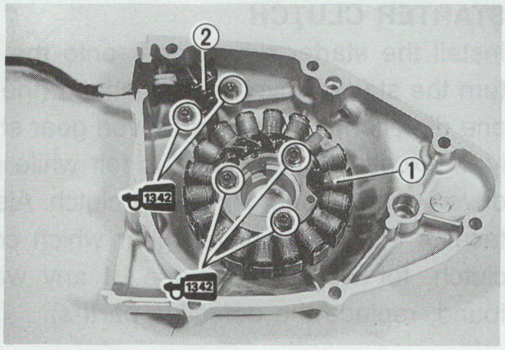
Starter clutch bolt: 10 N·m (1.0 kg-m, 7.0 lb-ft)



GENERATOR STATOR AND PICK-UP COIL

When replacing the generator stator ① or pick-up coil ②, apply THREAD LOCK "1342" to the generator stator set bolts and pick-up coil set bolts and tighten them.

1342 99000-32050: THREAD LOCK "1342"

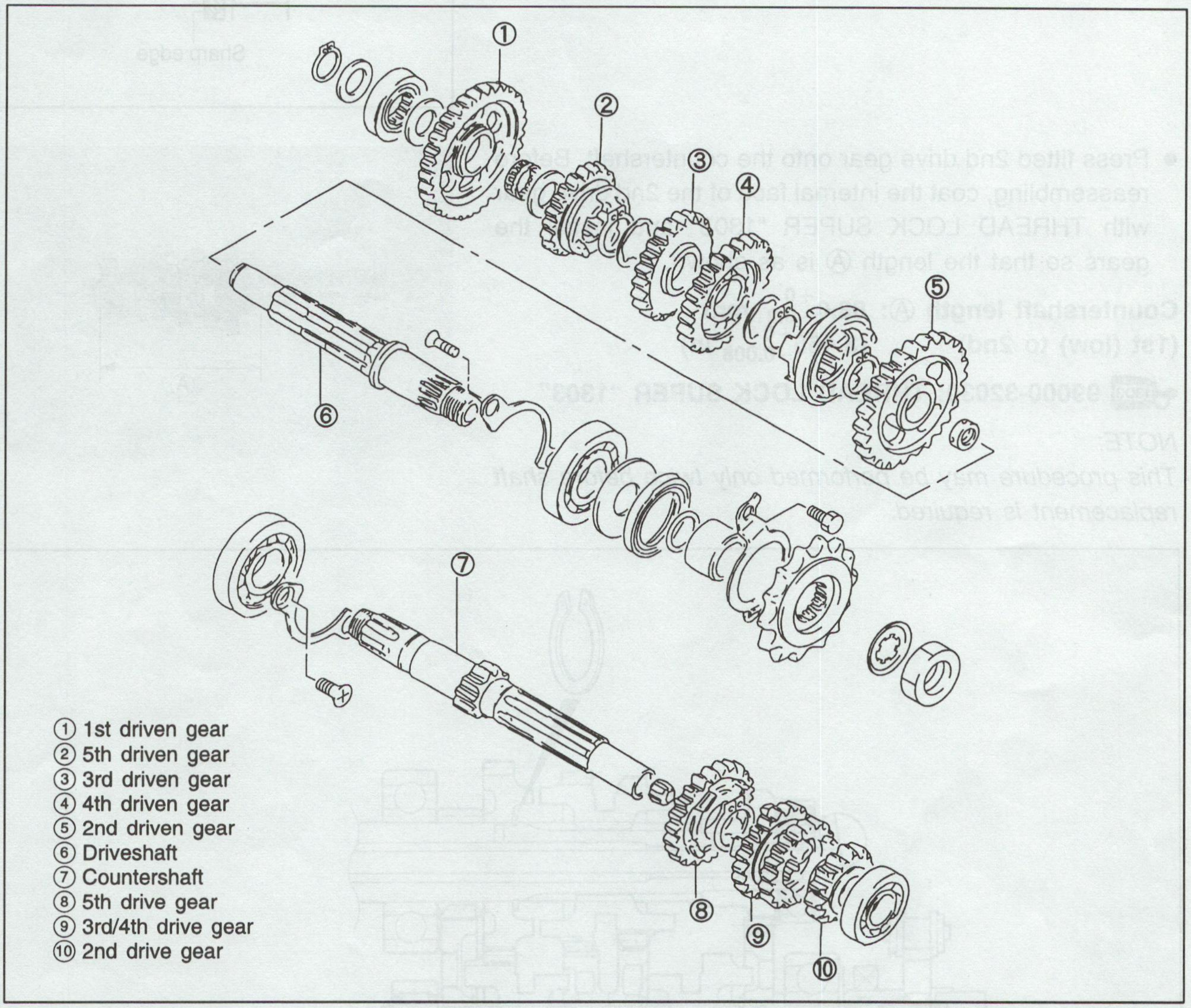


TRANSMISSION

DISASSEMBLY

- Disassemble the transmission gears as shown in the illustration.

NOTE:
When removing the 2nd drive gear, use a gear puller and a proper attachment.



① 1st driven gear
② 5th driven gear
③ 3rd driven gear
④ 4th driven gear
⑤ 2nd driven gear
⑥ Driveshaft
⑦ Countershaft
⑧ 5th drive gear
⑨ 3rd/4th drive gear
⑩ 2nd drive gear

REASSEMBLY

Assemble the countershaft and driveshaft in the reverse order of disassembly. Pay attention to the following points.

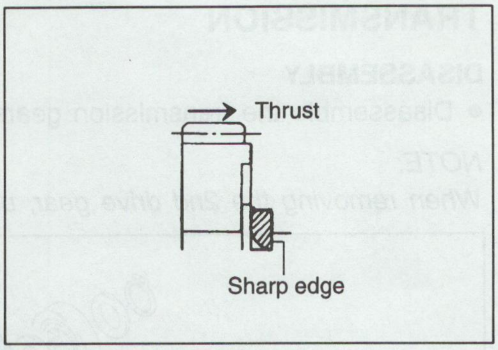
NOTE:
Before installing the gears, lightly coat the driveshaft and countershaft with moly paste or engine oil.

99000-25140: SUZUKI MOLY PASTE

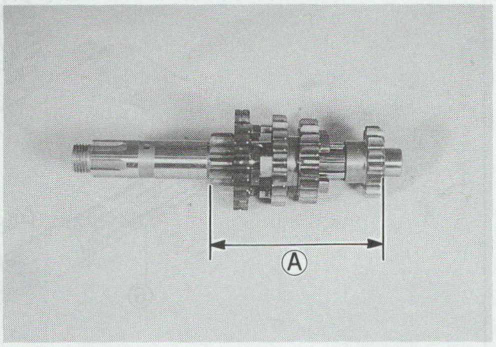
⚠ CAUTION

- **Never reuse a circlip. After a circlip has been removed from a shaft, it should be discarded and a new circlip must be installed.**
- **When installing a new circlip, do not expand the end gap larger than required to slip the circlip over the shaft.**
- **After installing a circlip, make sure that it is completely seated in its groove and securely fitted.**

- When installing a new circlip, pay attention to the direction of the circlip. Fit the circlip to the side where the thrust is as shown in the illustration. The rounded side should be against the gear surface.



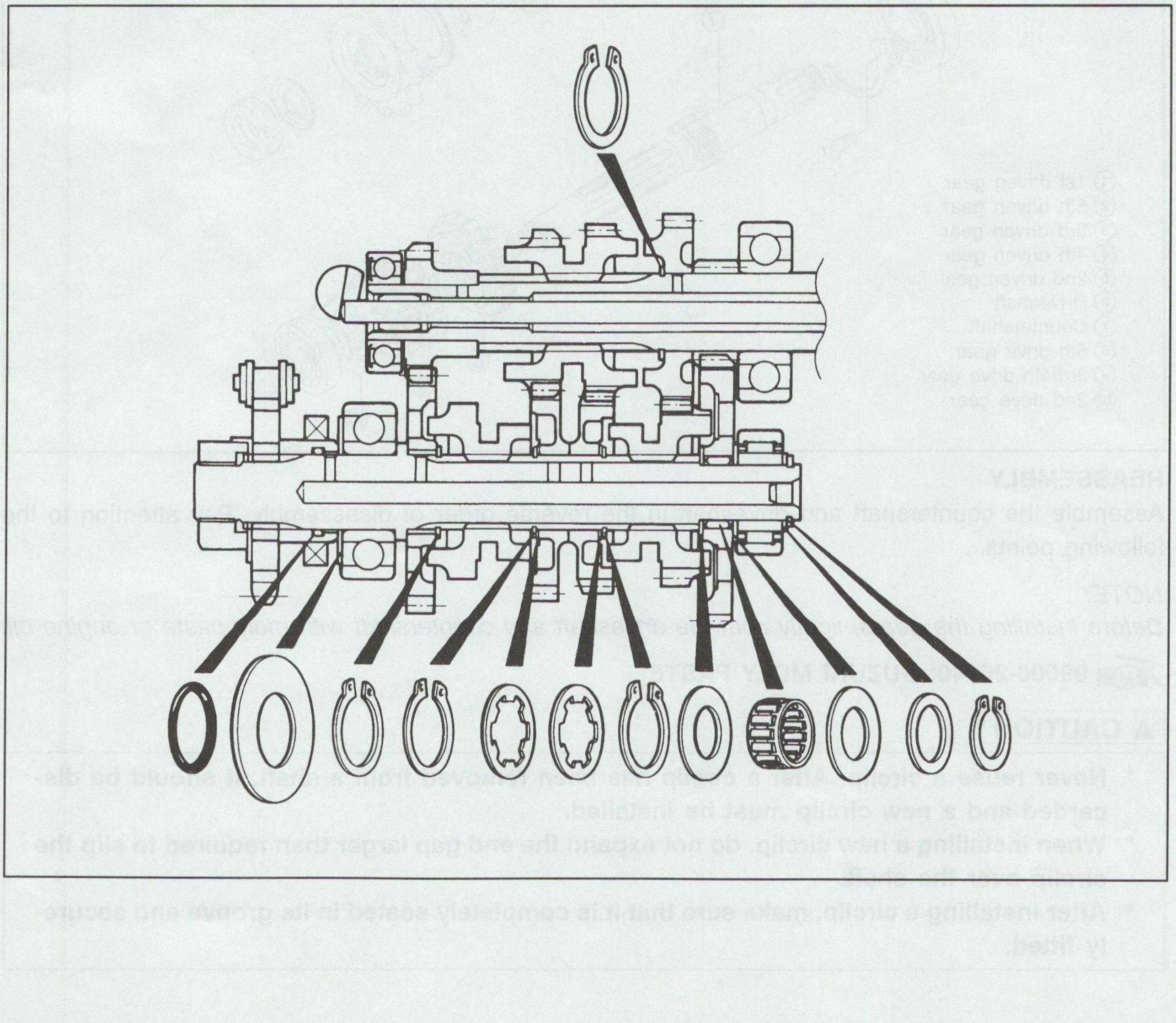
- Press fitted 2nd drive gear onto the countershaft. Before reassembling, coat the internal face of the 2nd drive gear with THREAD LOCK SUPER "1303" and install the gears so that the length Ⓐ is as shown.



Countershaft length Ⓐ: $88.0^{+0}_{-0.2}$ mm
(1st (low) to 2nd) $(3.465^{+0}_{-0.008}$ in)

1303 99000-32030: THREAD LOCK SUPER "1303"

NOTE:
This procedure may be performed only twice before shaft replacement is required.

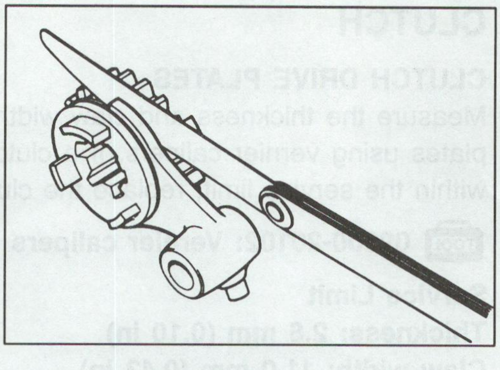


GEARSHIFT FORKS

Measure the gearshift fork clearance in the groove of its respective gear using the thickness gauge.

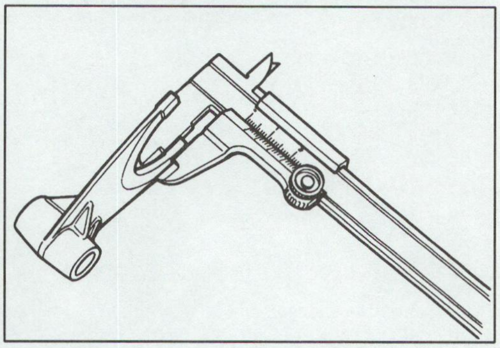
The clearance for each of the two gearshift forks plays an important role in the smoothness and positiveness of the shifting action. Each fork has its prongs fitted into the annular groove provided in its gear. During operation there is sliding contact between the fork and gear and, when a shifting action is initiated, the fork pushes the gear axially. If the clearance is too great, the meshed gears may slip apart.

If the clearance exceeds the specification, replace the fork, its respective gear or both.

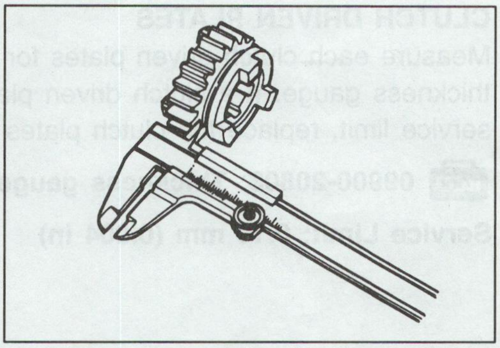


TOOL 09900-20803: Thickness gauge

Service Limit
Gearshift fork to groove clearance: 0.50 mm (0.020 in)



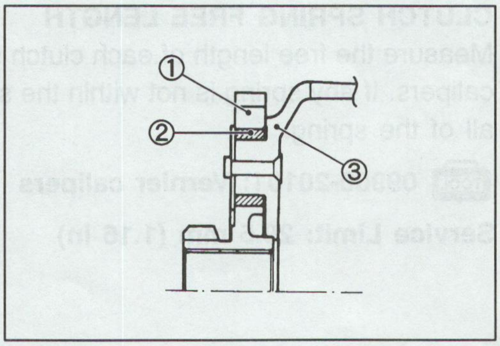
Standard
Gearshift fork groove width
No.1 & No.2: 5.0–5.1 mm (0.197–0.201 in)
No.3 : 5.5–5.6 mm (0.217–0.220 in)



Standard
Shift fork thickness
No.1 & No.2: 4.8–4.9 mm (0.189–0.193 in)
No.3 : 5.3–5.4 mm (0.209–0.213 in)

PRIMARY DRIVEN GEAR

If the internal damper wears, play is generated between gear and housing, causing abnormal noise. If the play is extreme, replace the primary driven gear assembly with a new one.



① Primary driven gear
② Damper
③ Clutch housing

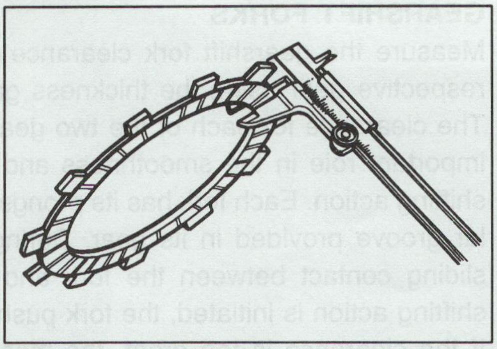
CLUTCH

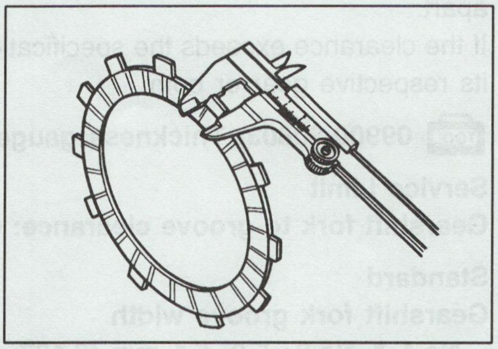
CLUTCH DRIVE PLATES

Measure the thickness and claw width of the clutch drive plates using vernier calipers. If a clutch drive plate is not within the service limit, replace the clutch plates as a set.

TOOL 09900-20102: Vernier calipers

Service Limit
Thickness: 2.6 mm (0.10 in)
Claw width: 11.0 mm (0.43 in)



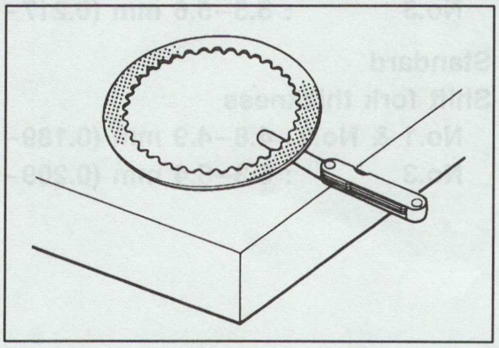


CLUTCH DRIVEN PLATES

Measure each clutch driven plates for distortion using the thickness gauge. If a clutch driven plate is not within the service limit, replace the clutch plates as a set.

TOOL 09900-20803: Thickness gauge

Service Limit: 0.10 mm (0.004 in)

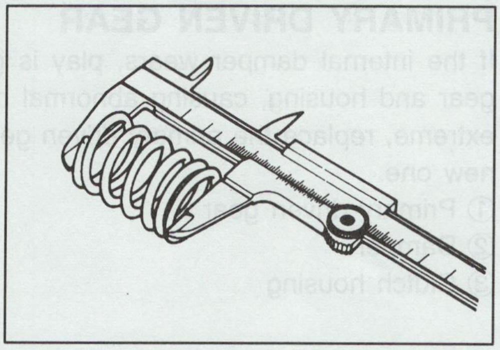


CLUTCH SPRING FREE LENGTH

Measure the free length of each clutch spring using vernier calipers. If any spring is not within the service limit, replace all of the spring.

TOOL 09900-20101: Vernier calipers

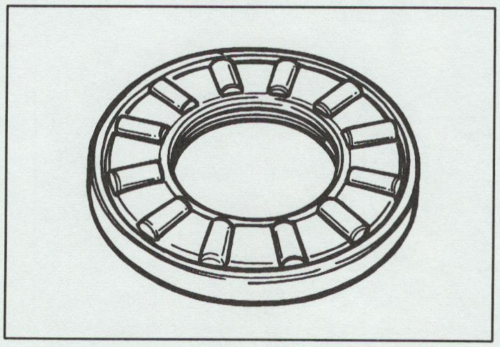
Service Limit: 29.5 mm (1.16 in)



CLUTCH RELEASE BEARING

Inspect the clutch release bearing for any abnormality, especially cracks. When removing the bearing from the clutch, decide whether it can be reused or if it should be replaced.

Smooth engagement and disengagement of the clutch depends on the condition of this bearing.



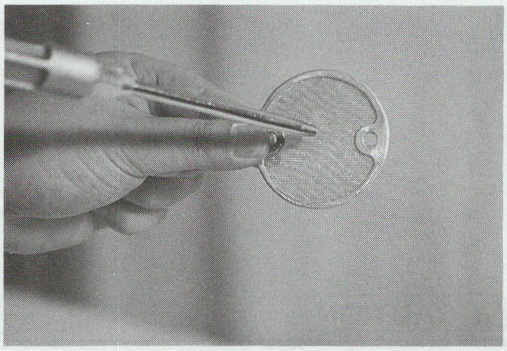
OIL SUMP FILTER

INSPECTION

Check the oil sump filter for any damage or clogs.

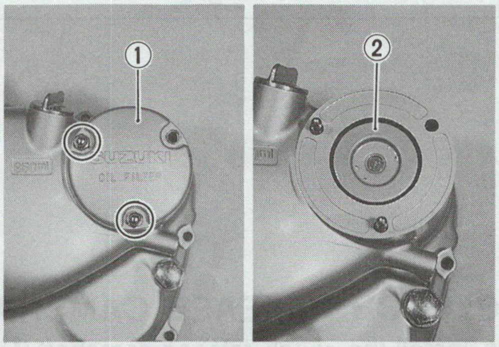
CLEANING

Clean the oil sump filter with a compressed air.



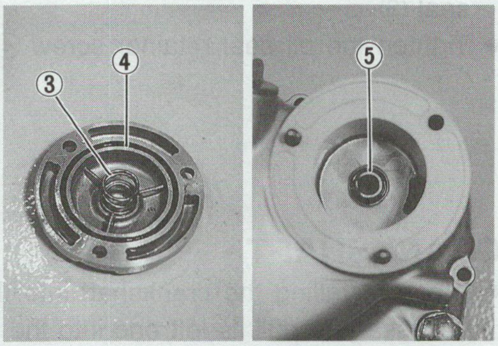
OIL FILTER

- Remove the oil filter cap ①.
- Remove the oil filter ② and install a new one.



NOTE:
Before installing the new oil filter and oil filter cap, make sure that the spring ③ and new O-rings (④, ⑤) are installed correctly.

- Install the oil filter cap.



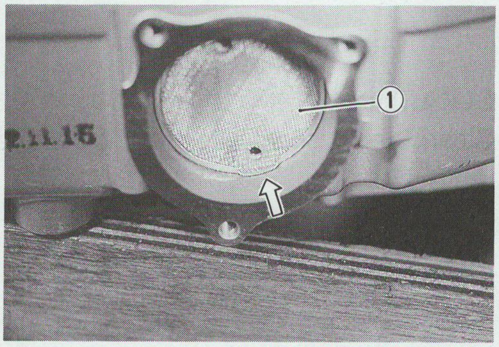
ENGINE REASSEMBLY

Reassemble the engine in the reverse order of disassembly. The following steps require special attention or precautionary measures should be taken.

NOTE:
Apply engine oil to each running and sliding part before reassembling.

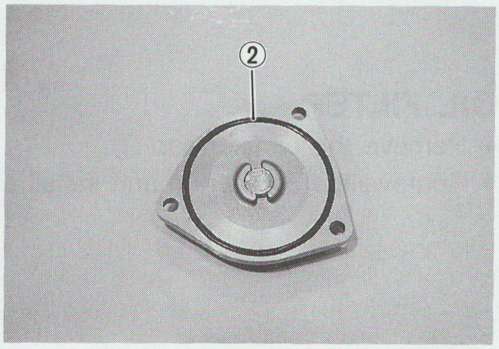
OIL SUMP FILTER

- Install the oil sump filter ① in the correct direction.



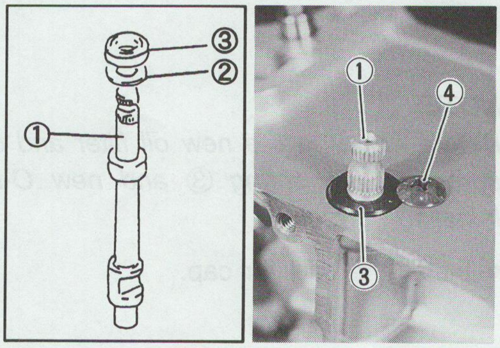
⚠ CAUTION

Replace the O-ring ② with a new one.



CLUTCH RELEASE CAMSHAFT

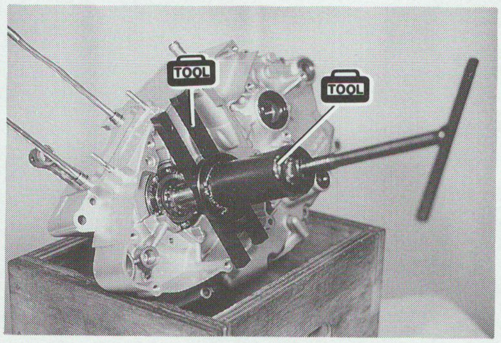
- Install the clutch release camshaft ①, washer ② and oil seal ③.
- Tighten the oil seal retainer screw ④.



CRANKSHAFT

- When installing the crankshaft into the crankcase, it is necessary to pull its left end into the left crankcase with the special tools.

TOOL **09910-32812: Crankshaft installer**
09910-20116: Conrod holder



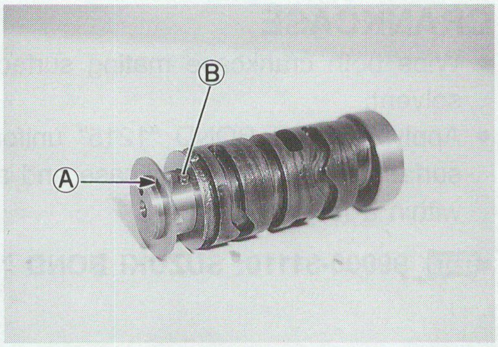
⚠ CAUTION

Never install the crankshaft into the crankcase by striking it with a plastic hammer. Always use the special tool, otherwise crankshaft may be misaligned.

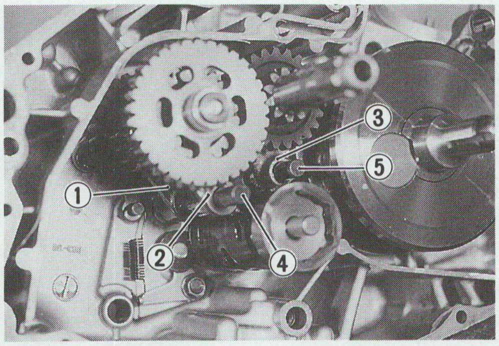
- Apply engine oil to the crankshaft bearings.

GEARSHIFT CAM AND GEARSHIFT FORKS

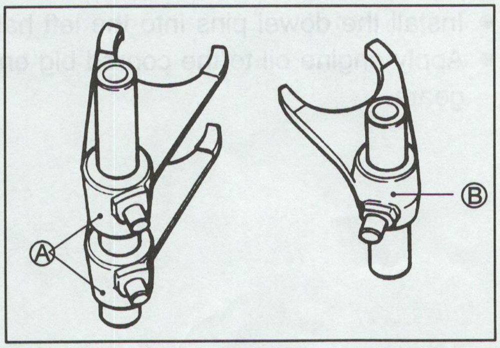
- Install the transmission.
- Align the pin groove Ⓐ of gearshift cam stopper plate with the pin Ⓑ on the gearshift cam.



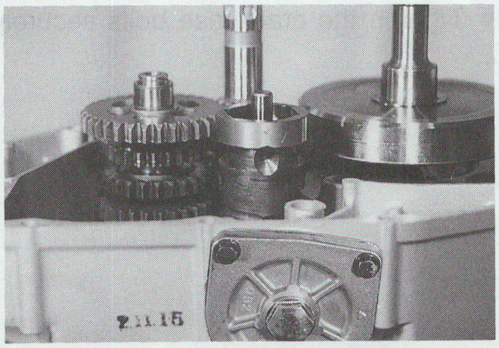
- Install the gearshift forks and gearshift cam.
  ①: Gearshift fork No.1
  ②: Gearshift fork No.2
  ③: Gearshift fork No.3
- Install the gearshift fork shafts (④, ⑤).



NOTE:
Two kinds of gearshift forks (Ⓐ, Ⓑ) are used. They resemble each other very closely in external appearance and configuration. Carefully examine the illustration for correct installing positions and directions.



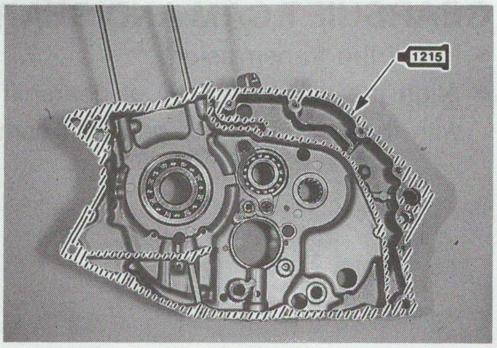
NOTE:
Position the gearshift cam as shown in Fig. so that the gearshift fork shafts can be installed easily.

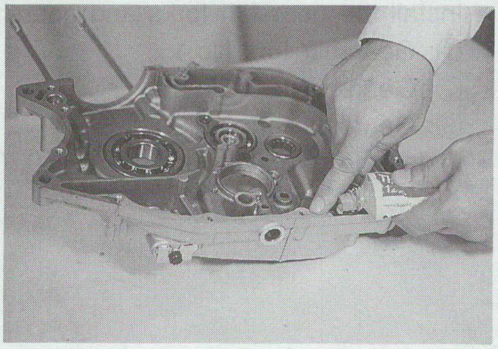


CRANKCASE

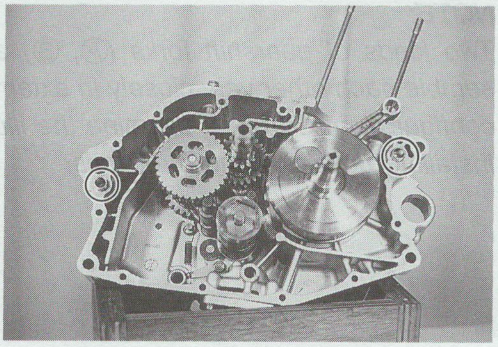
- Wipe both crankcase mating surfaces with a cleaning solvent.
- Apply SUZUKI BOND "1215" uniformly to the mating surface of the right crankcase and assemble the cases within a few minutes.

1215 99000-31110: SUZUKI BOND "1215"

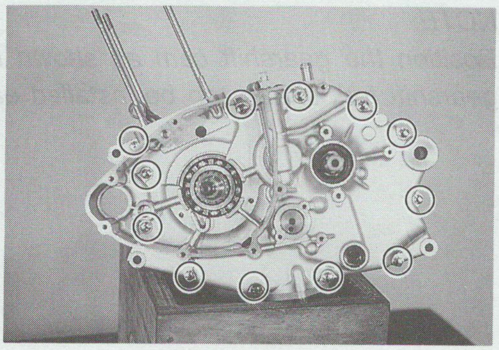




- Install the dowel pins into the left half of the crankcase.
- Apply engine oil to the conrod big end and transmission gears.



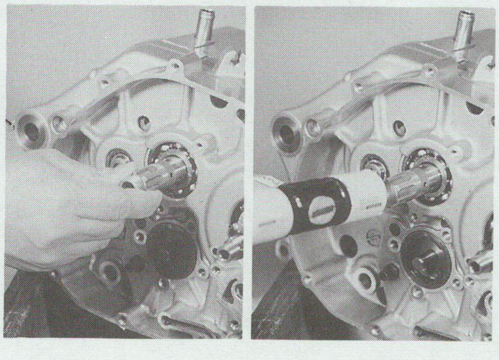
- Tighten the crankcase bolts securely.



NOTE:

** After the crankcase bolts have been tightened, make sure that the crankshaft, countershaft and driveshaft rotate smoothly.*

** If these shafts do not rotate smoothly, try to free it by tapping with a plastic hammer.*



ENGINE SPROCKET SPACER

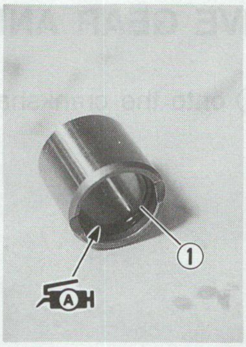
- Apply SUZUKI SUPER GREASE "A" to the O-ring ① of the engine sprocket spacer and the oil seal lip, and then install the engine sprocket spacer onto the driveshaft.

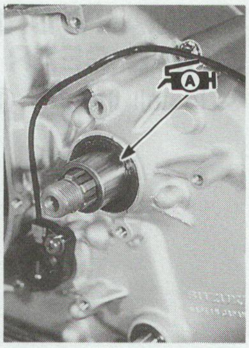
99000-25010: SUZUKI SUPER GREASE "A"

▲ CAUTION

Use a new O-ring ①.

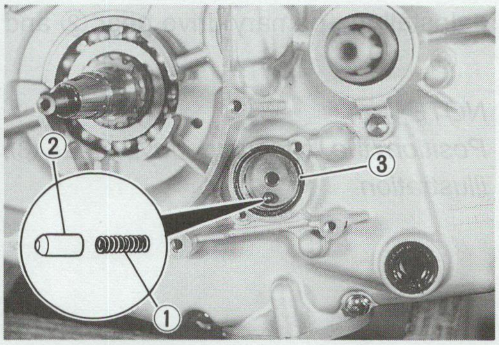
- Install the oil seal retainer.





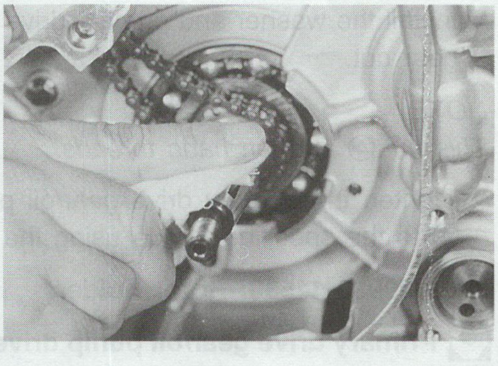
NEUTRAL SWITCH

- Install the spring ① and neutral switch contact ② and new O-ring ③.
- Install the neutral switch.



GENERATOR ROTOR

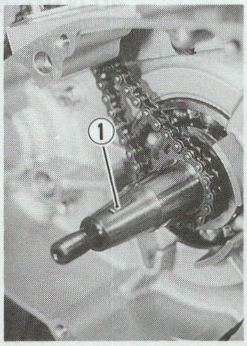
- Remove any grease from the tapered portion of the generator rotor and crankshaft.

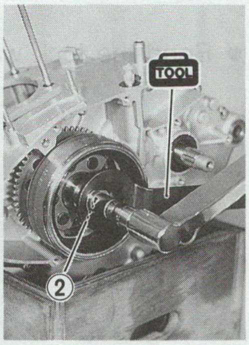


- Install the generator rotor key ①.
- Install the generator rotor securely.
- Tighten the generator rotor nut ② to the specified torque using the special tool.

TOOL 09930-44530: Rotor holder

Generator rotor nut : 55 N·m (5.5 kg-m, 40.0 lb-ft)



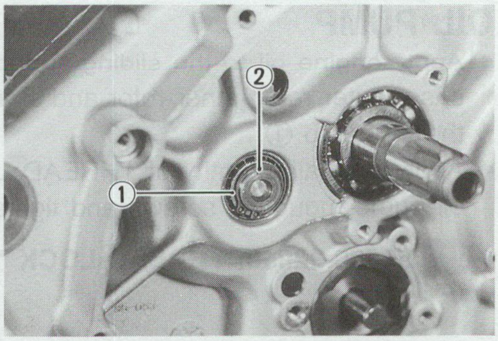


DRIVESHAFT RETAINER

- Install the washer ① and circlip ② to the driveshaft.

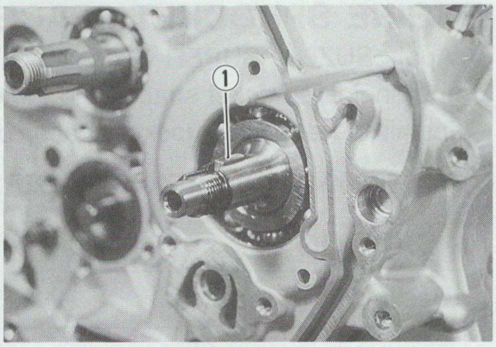
▲ CAUTION

Use a new circlip ②.



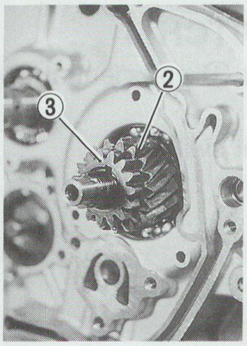
PRIMARY DRIVE GEAR AND OIL PUMP DRIVE GEAR

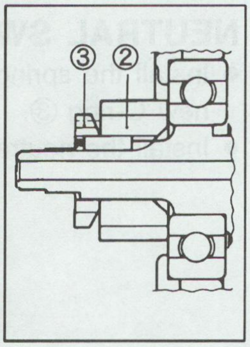
- Install the key ① onto the crankshaft.



- Install the primary drive gear ② and oil pump drive gear ③.

NOTE:
Position the oil pump drive gear ③, as shown in the illustration.





- Install the washer and primary drive gear/oil pump drive gear nut.

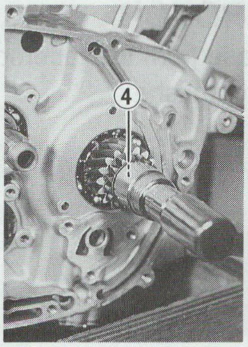
NOTE:
This nut ④ has left hand threads.

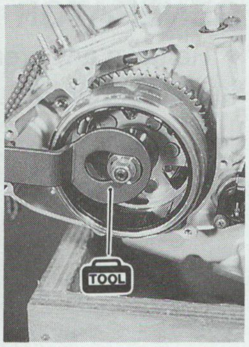
- Tighten the primary drive gear/oil pump drive gear nut ④ to the specified torque using the special tool.

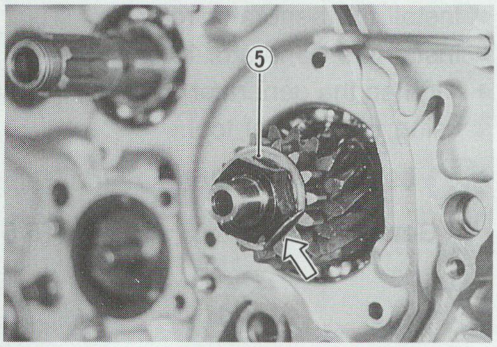
TOOL **09930-44530: Rotor holder**

Primary drive gear/oil pump drive gear nut : 50 N·m (5.0 kg-m, 36.0 lb-ft)

- Bend the lock washer ⑤ securely.



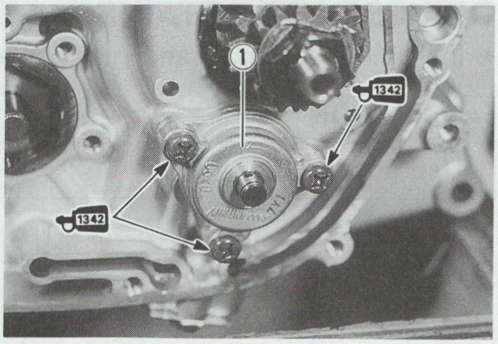




OIL PUMP

- Apply engine oil to the sliding surfaces of the oil pump case, outer rotor, inner rotor and shaft, before mounting the oil pump ①.
- Apply a small quantity of THREAD LOCK "1342" to the oil pump mounting screws and tighten them.

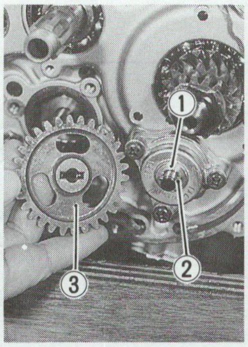
1342 **99000-32050: THREAD LOCK "1342"**

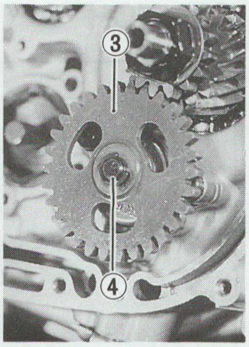


- Install the washer ① and pin ②.
- Install the oil pump driven gear ③ and E-ring ④.

▲ CAUTION

Use a new E-ring ④.

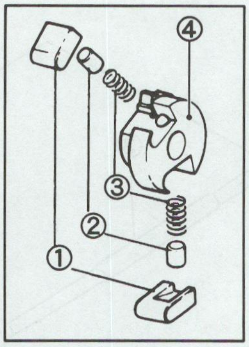


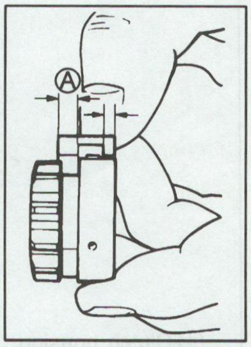


GEARSHIFT CAM DRIVEN GEAR

- Install each pawl into the gearshift cam driven gear.
  - ① Gearshift pawl
  - ② Pin
  - ③ Spring
  - ④ Gearshift cam driven gear

NOTE:
The large shoulder Ⓐ must face to the outside.

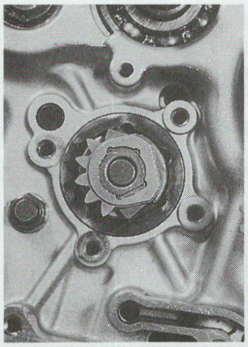


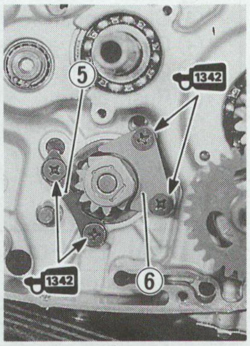


- Install the gearshift cam driven gear assembly.
- Install the pawl lifter ⑤ and cam guide ⑥.

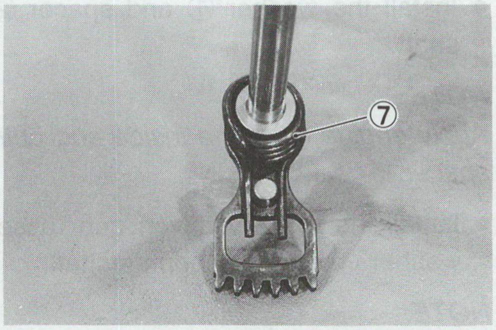
NOTE:
Apply a small quantity of THREAD LOCK “1342” to the threads of the screws.

1342 99000-32050: THREAD LOCK “1342”



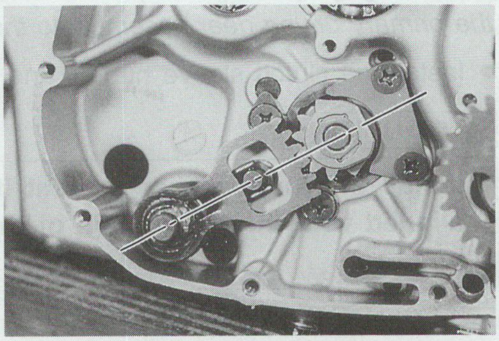


- Install the return spring ⑦ to the gearshift shaft.

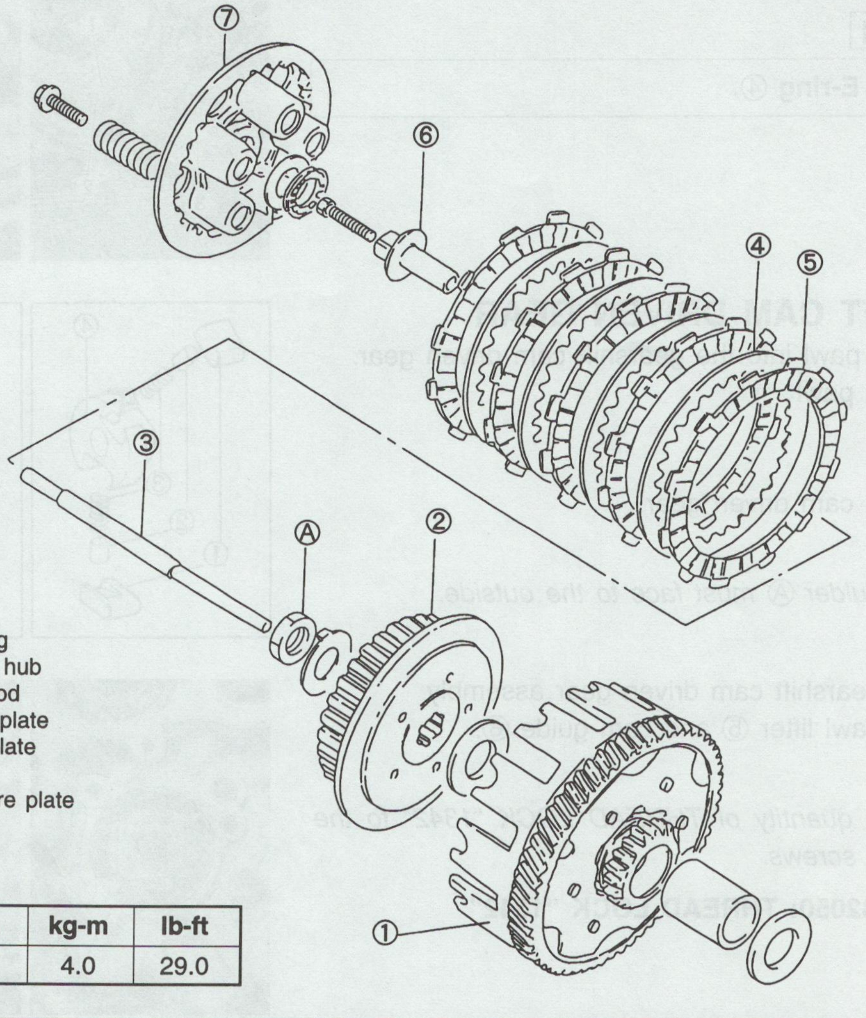


- Install the gearshift shaft.

NOTE:
Align the center teeth on the gearshift shaft with the center teeth on the gearshift cam driven gear.



CLUTCH



① Clutch housing
② Clutch sleeve hub
③ Clutch push rod
④ Clutch driven plate
⑤ Clutch drive plate
⑥ Push piece
⑦ Clutch pressure plate

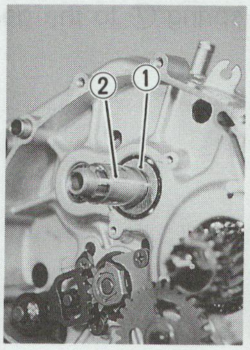
ITEM	N·m	kg-m	lb-ft
Ⓐ	40	4.0	29.0

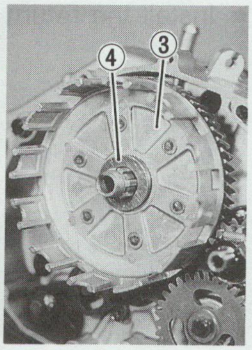
- Install the washer ① and spacer ② onto the countershaft.

NOTE:
Apply engine oil to the inside and outside surfaces of the spacer.

- Install the primary driven gear assembly ③ and thrust washer ④ onto the countershaft.

NOTE:
When engaging the primary drive and driven gears, turn the primary driven gear assembly to the counterclockwise.

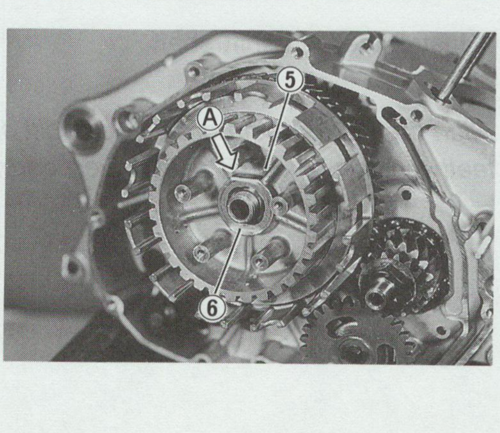




- Install the clutch sleeve hub ⑤ and lock washer ⑥.

▲ CAUTION

Install the lock washer so that its tongue Ⓐ is aligned with the flat portion of the clutch sleeve hub.

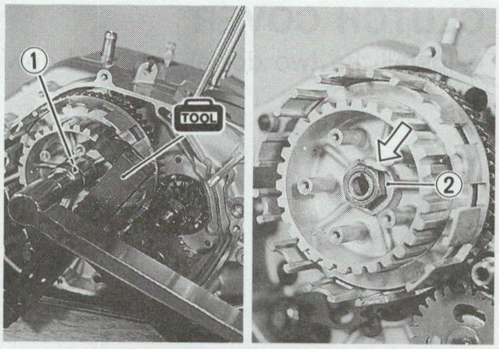


- Install the clutch sleeve hub nut ①, and tighten it to the specified torque using the special tool.

TOOL 09920-53740: Clutch sleeve hub holder

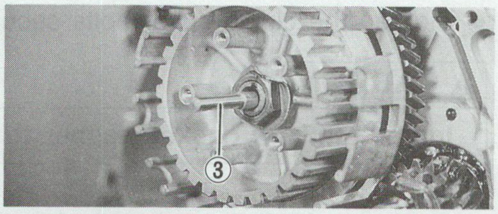
Clutch sleeve hub nut: 40 N·m (4.0 kg-m, 29.0 lb-ft)

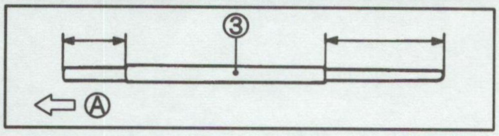
- Bend the lock washer ② securely.



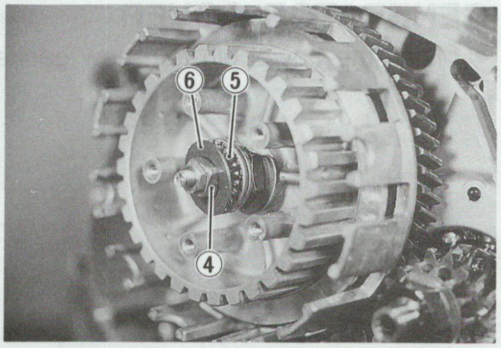
- Install the clutch push rod ③ as shown in the illustration.

Ⓐ Push piece side



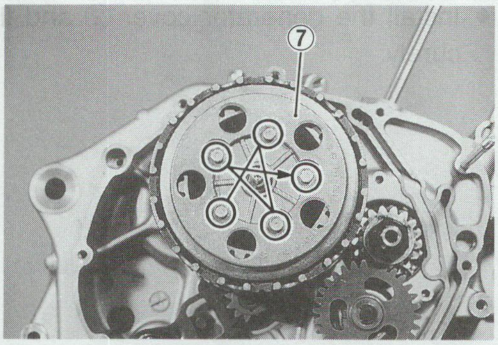


- Install the push piece ④, bearing ⑤ and washer ⑥.

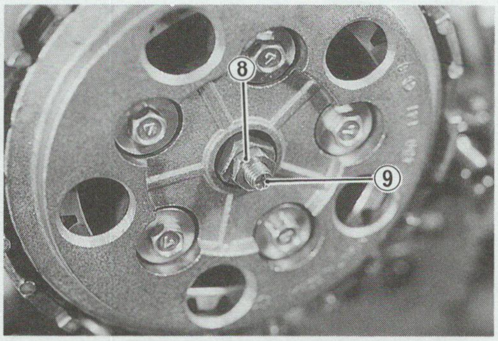


- Install the clutch drive and driven plates one by one into the clutch sleeve hub.
- Install the clutch pressure plate ⑦, clutch springs and clutch spring mounting bolts.
- Hold the generator rotor nut and tighten the clutch spring mounting bolts in a crisscross pattern.

NOTE:
Make sure that the clutch pressure plate is installed correctly.

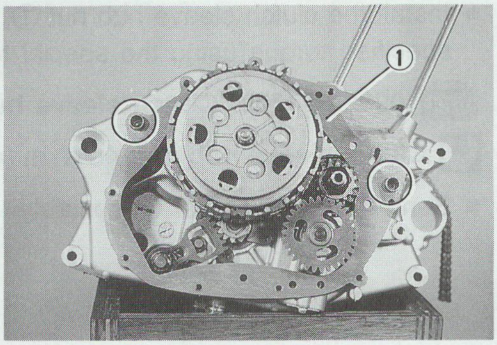


- Loosen the lock nut ⑧, and turn in the release screw ⑨ to feel resistance.
- From that position, turn out the release screw ⑨ 1/8–1/4 turn, and tighten the lock nut ⑧ by holding the release screw ⑨.



CLUTCH COVER

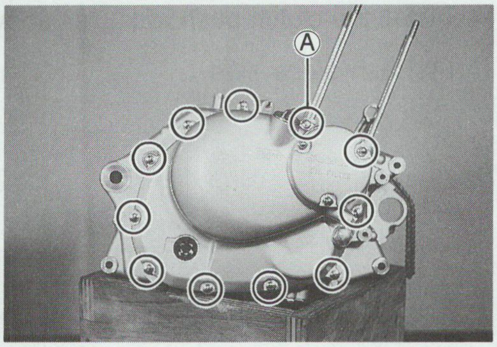
- Install the two dowel pins and new gasket ①.



- Tighten the clutch cover bolts securely.

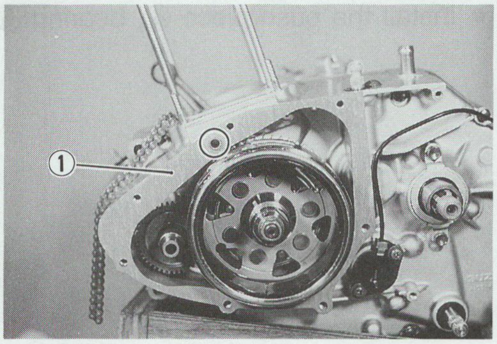
▲ CAUTION

Install the new gasket washer to the bolt Ⓐ.

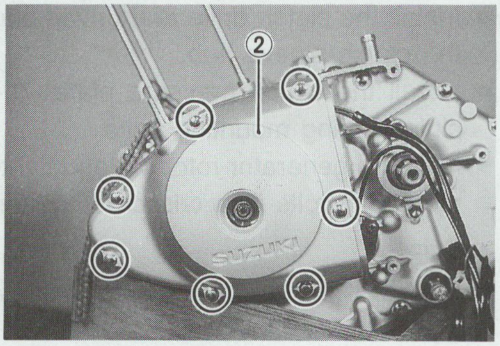


GENERATOR COVER

- Install the dowel pin and new gasket ①.

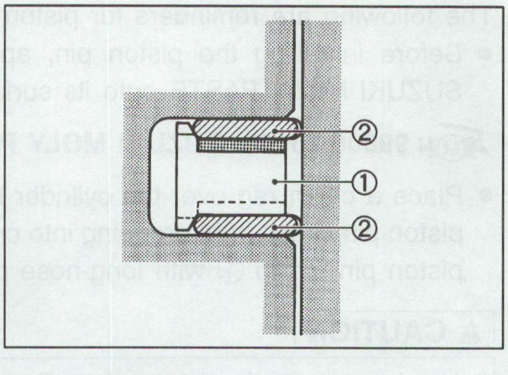


- Install the generator cover ② and tighten the bolts securely.



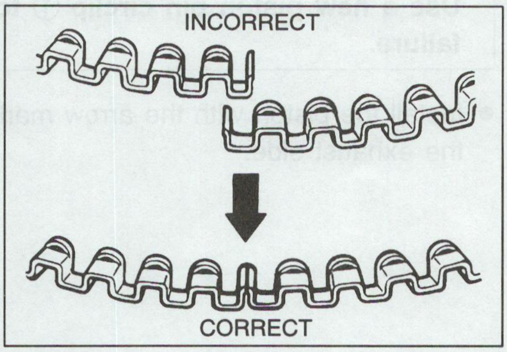
PISTON AND PISTON RING

- First, install a spacer ① into the oil ring groove and then install the two side rails ②. The spacer and side rails do not have a specific top or bottom when they are new. When reassembling used parts, install them in their original place and direction.

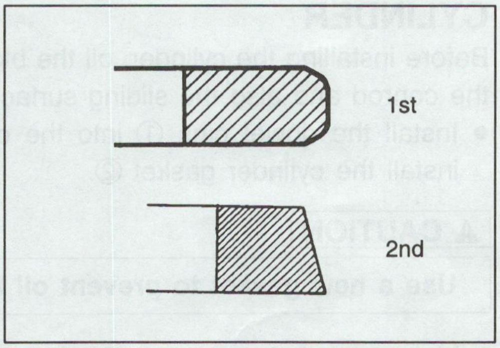


▲ CAUTION

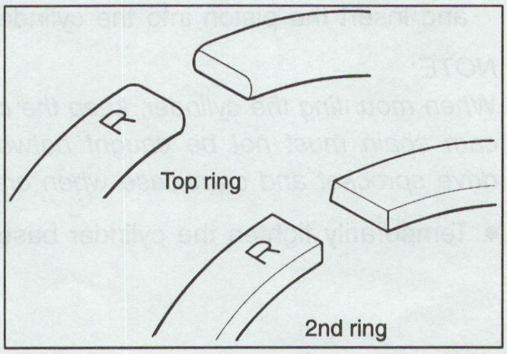
When installing the spacer, be careful not to allow its two ends to overlap in the piston ring groove.


INCORRECT
CORRECT

- Same way in which to distinguish the 1st and 2nd piston rings:
  1. Their ring face shapes are different.
  2. The 1st piston ring's face is chrome-plated.
  3. The 2nd piston ring appears darker in color.



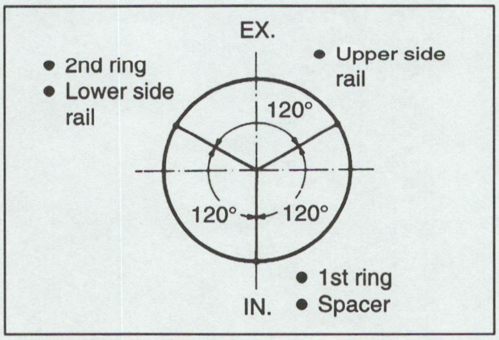
- The 1st and 2nd piston should be installed with their marks facing up.


R
Top ring
R
2nd ring

- Position the piston ring gaps as shown.

NOTE:

Before inserting the piston into the cylinder, check that the gaps are properly positioned.

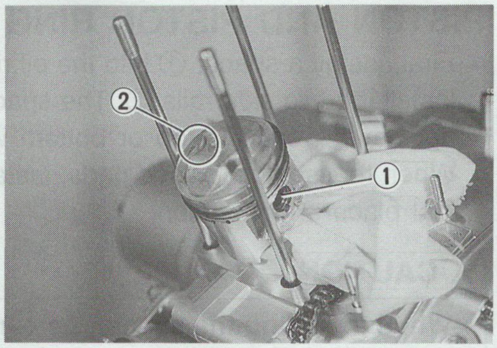

EX.
• 2nd ring
• Lower side rail
• Upper side rail
120°
120°
120°
• 1st ring
• Spacer
IN.

The following are reminders for piston installation:

- Before installing the piston pin, apply a light coat of SUZUKI MOLY PASTE onto its surface.

99000-25140: SUZUKI MOLY PASTE

- Place a clean rag over the cylinder base to prevent the piston pin circlip from dropping into crankcase. Install the piston pin circlip ① with long-nose pliers.



⚠ CAUTION

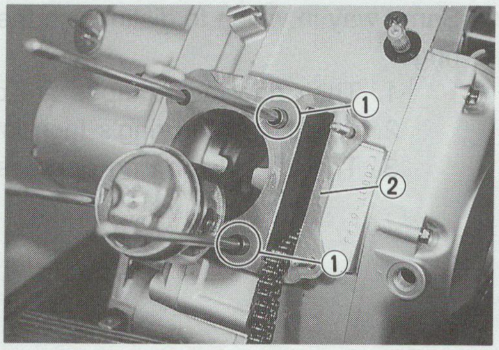
Use a new piston pin circlip ① to prevent circlip failure.

- Install the piston with the arrow mark ② facing towards the exhaust side.

CYLINDER

Before installing the cylinder, oil the big and small ends of the conrod and also the sliding surface of the piston.

- Install the dowel pins ① into the crankcase and then install the cylinder gasket ②.



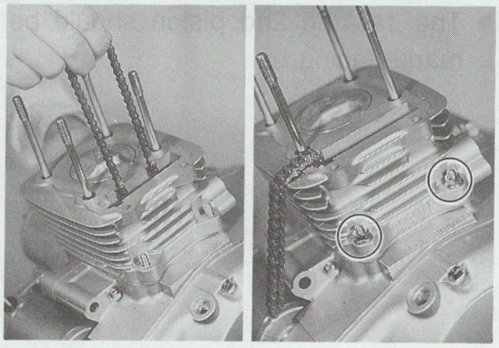
⚠ CAUTION

Use a new gasket to prevent oil leakage.

- Make sure that the piston rings are properly positioned, and insert the piston into the cylinder.

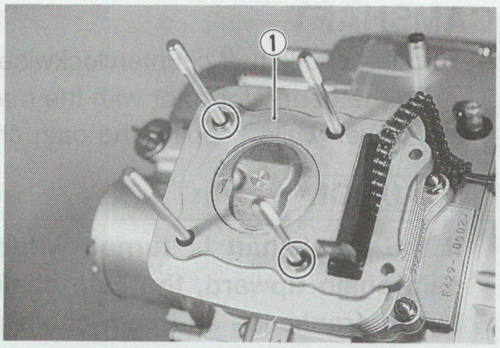
NOTE:
When mounting the cylinder, keep the cam chain taut. The cam chain must not be caught between the cam chain drive sprocket and crankcase when crankshaft is rotated.

- Temporarily tighten the cylinder base nuts.



CYLINDER HEAD

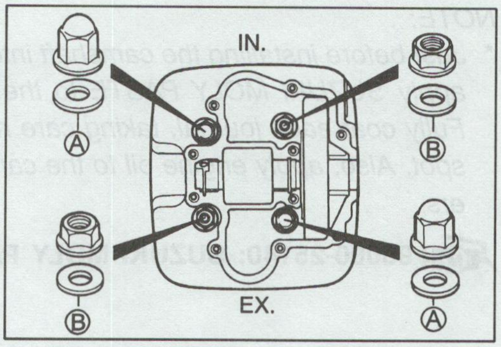
- Install the dowel pins into the cylinder and then install the cylinder head gasket ① onto the cylinder.



▲ CAUTION

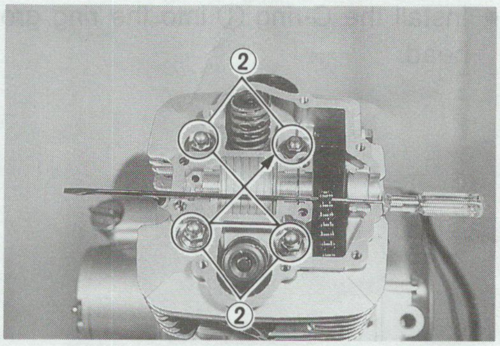
Use a new gasket to prevent gas leakage.

- Place the cylinder head onto the cylinder.
- Cylinder head nuts and washers must be installed correctly as shown in the illustration.
  Ⓐ Copper washer
  Ⓑ Steel washer



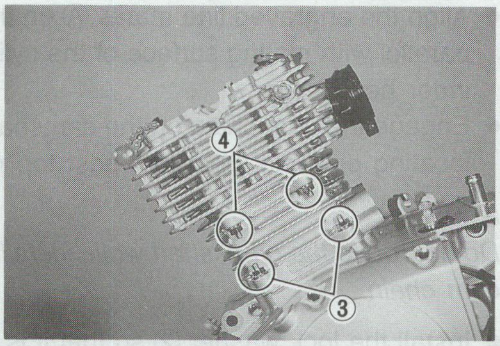
- Tighten the cylinder head nuts (8-mm) ② to the specified torque in a crisscross pattern.

Cylinder head nut (8-mm) ②: 27 N·m
(2.7 kg-m, 19.5 lb-ft)



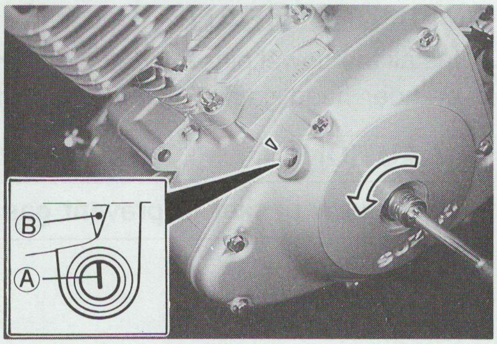
- Tighten the cylinder base nuts ③ and cylinder head nuts (6-mm) ④ to the specified torque.

Cylinder base nut ③: 10 N·m (1.0 kg-m, 7.0 lb-ft)
Cylinder head nut (6-mm) ④: 10 N·m
(1.0 kg-m, 7.0 lb-ft)



CAMSHAFT

- Turn the crankshaft counterclockwise, and align the line Ⓐ on the generator rotor with the mark Ⓑ on the generator cover while keeping the cam chain tight.

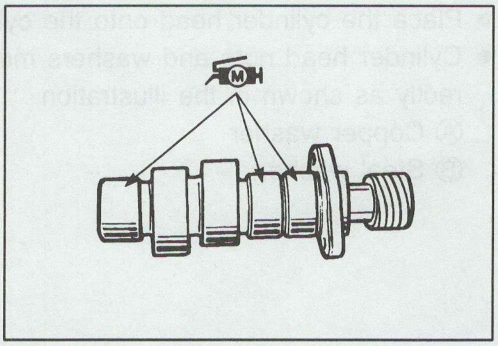


⚠ CAUTION

If the crankshaft is turned without drawing the cam chain upward, the cam chain will catch between crankcase and cam chain drive sprocket.

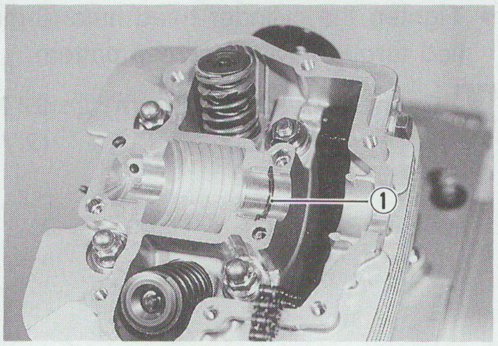
NOTE:

* *Just before installing the camshaft into the cylinder head, apply SUZUKI MOLY PASTE to the camshaft journals. Fully coat each journal, taking care not to leave any dry spot. Also, apply engine oil to the camshaft journal holders.*

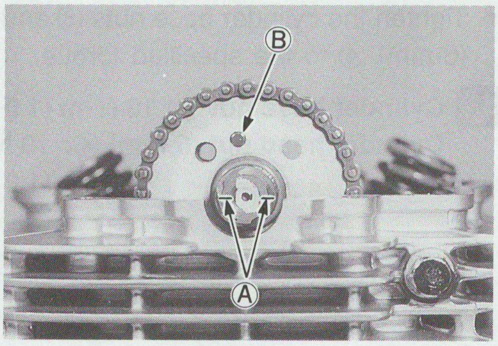


MH 99000-25140: SUZUKI MOLY PASTE

- Install the C-ring ① into the ring groove of the cylinder head.



- Align the engraved line marks Ⓐ on the camshaft so it is parallel with mating surface of the cylinder head and cylinder head cover.
- Engage the cam chain on the camshaft sprocket with the locating pin hole Ⓑ at just past top position.



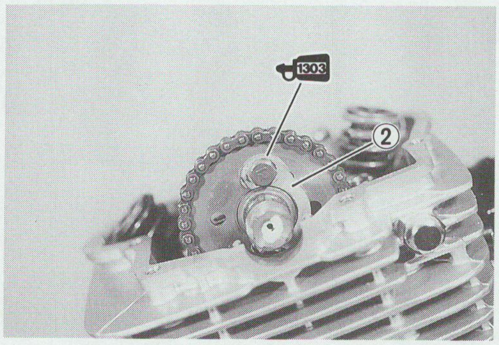
NOTE:

Do not rotate the crankshaft while installing the camshaft or cam chain.

- Install the lock washer ② so that it is covering the locating pin.

NOTE:

Apply a small quantity of THREAD LOCK SUPER "1303" to the threads of the camshaft sprocket bolts.

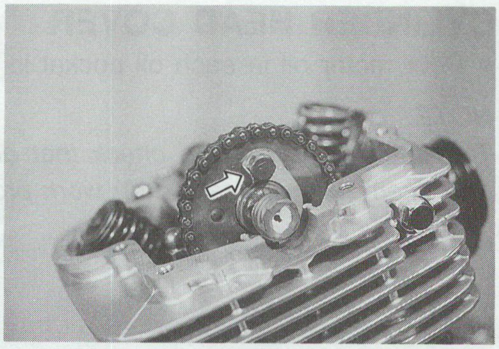


1303 99000-32030: THREAD LOCK SUPER "1303"

- Tighten the camshaft sprocket bolts to the specified torque.

Camshaft sprocket bolt : 11 N·m (1.1 kg-m, 8.0 lb-ft)

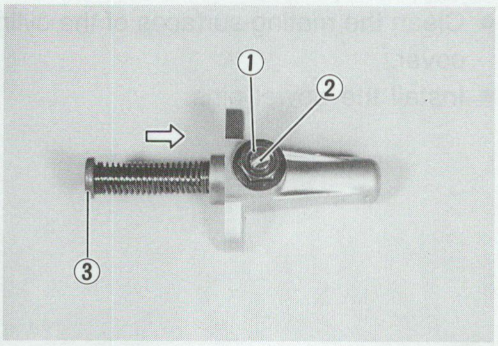
- Bend the lock washer securely.



CAM CHAIN TENSION ADJUSTER

Install the cam chain tension adjuster following the procedure below.

- After loosening the lock nut ①, loosen the set screw ② one turn and fully insert the push rod ③ into the adjuster body. Lock the push rod ③ by tightening the set screw ②.

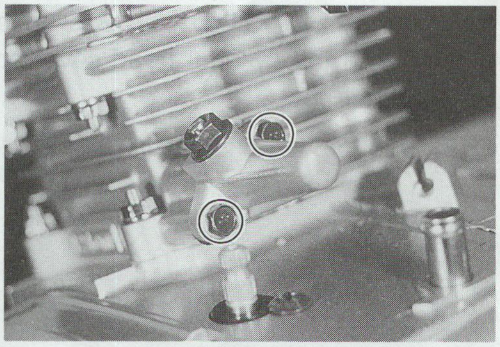


- Install the cam chain tension adjuster to the cylinder and tighten its mounting bolts to the specified torque.

Cam chain tension adjuster mounting bolt:
7 N·m (0.7 kg-m, 5.0 lb-ft)

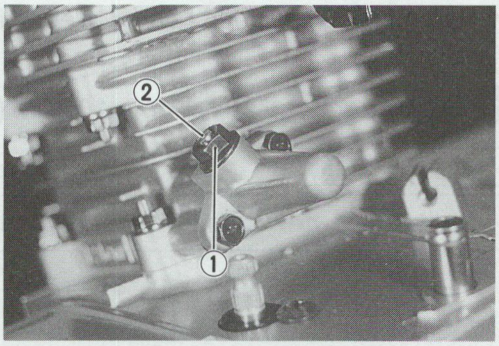
⚠ CAUTION

Replace the gasket with a new one.



- Turn the crankshaft normal direction, and stop it at exhaust valve operating position.
- Loosen the set screw ② one turn.
- Tighten the set screw ② to lock the tensioner push rod and then tighten the lock nut ① to the specified torque.

Cam chain tension adjuster lock nut:
12 N·m (1.2 kg-m, 8.5 lb-ft)

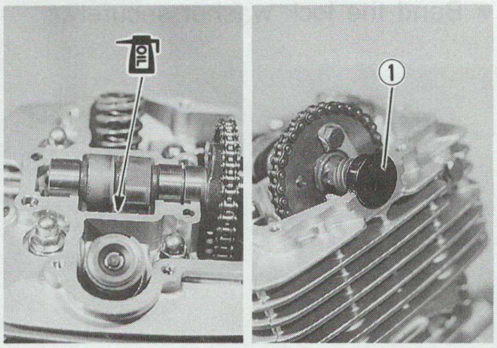


CYLINDER HEAD COVER

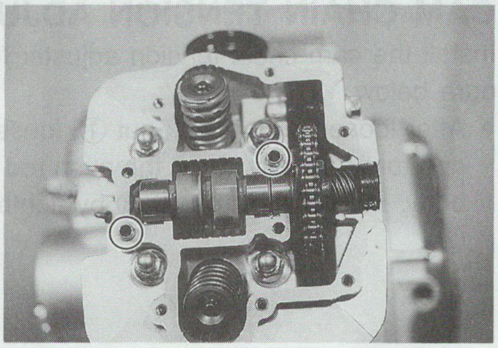
- Pour motor oil in each oil pocket in the cylinder head.

NOTE:
Turn the crankshaft and check that all the moving parts (e.g., cam follower, camshaft) work properly.

- Install the camshaft end cap ①.

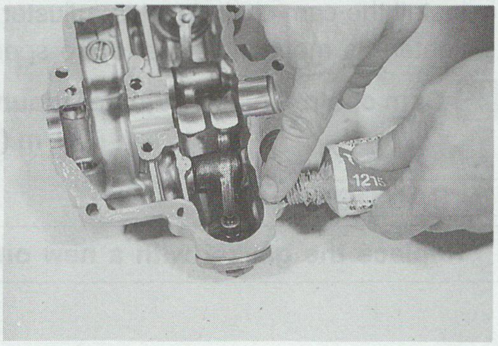


- Clean the mating surfaces of the cylinder head and head cover.
- Install the dowel pins.



- Apply SUZUKI BOND NO.1215 uniformly to the mating surface of the cylinder head cover and install it within a few minutes.

1215 99000-31110: SUZUKI BOND NO.1215

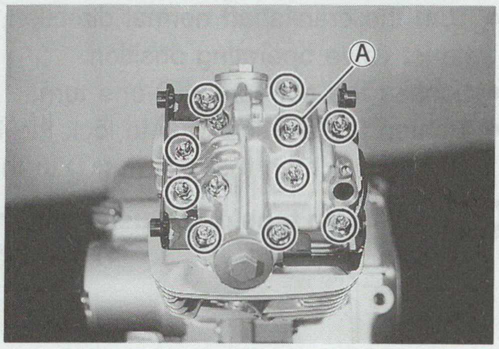


- Tighten the cylinder head cover bolts to the specified torque.

Cylinder head cover bolt: 10 N·m (1.0 kg-m, 7.0 lb-ft)

▲ CAUTION

Install the new gasket washer to the bolt Ⓐ.



▲ CAUTION

Be sure to check the valve clearance. (See pp. 2-3 and -4.)

FUEL AND LUBRICATION SYSTEM

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FUEL TANK AND FUEL VALVE 4- 1
  REMOVAL 4- 1
  INSPECTION 4- 1
  REMOUNTING 4- 1
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  I.D. NO. LOCATION 4- 2
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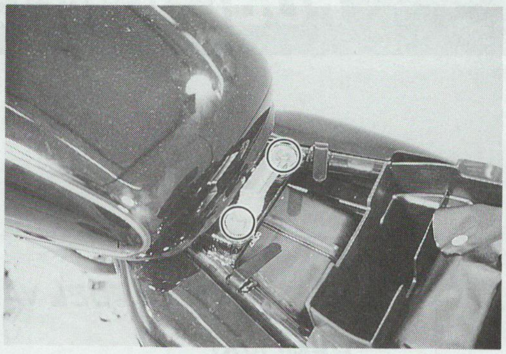
  OIL PRESSURE 4- 9
  OIL FILTER 4- 9
  OIL SUMP FILTER 4- 9
  ENGINE LUBRICATION SYSTEM CHART 4-10

FUEL TANK AND FUEL VALVE

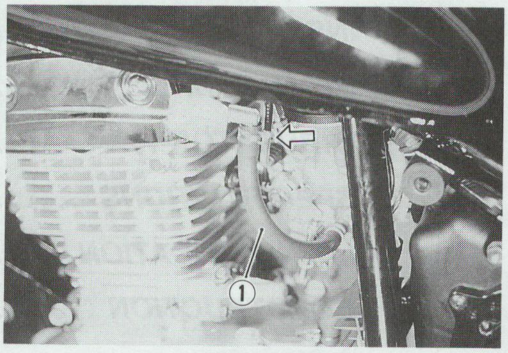
REMOVAL

⚠WARNING

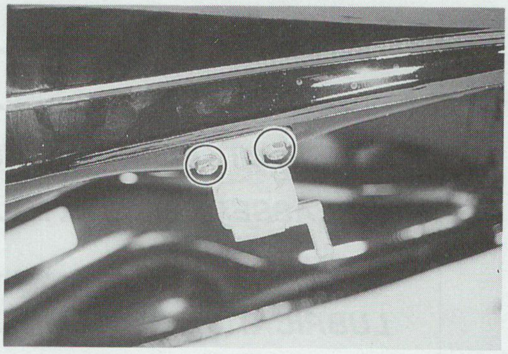
> **Gasoline is very explosive. Extreme care must be taken.**



- Remove the front seat. (See p. 5-1.)
- Remove the fuel tank mounting bolts.



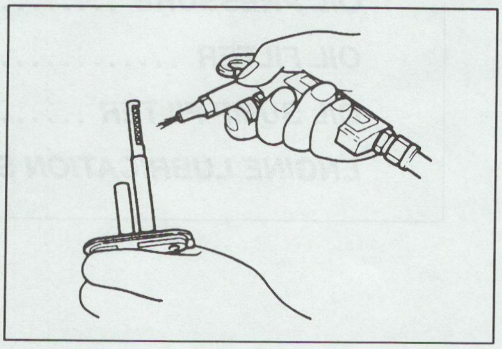
- Turn the fuel valve to "OFF" and disconnecting the fuel hose ①.
- Remove the fuel tank.



- Remove the fuel valve.

INSPECTION

FUEL VALVE



If the fuel filter is dirty with sediment or rust, fuel will not flow smoothly and loss in engine power may result. Clean the fuel filter with compressed air. Also check the fuel filter for cracks.

⚠WARNING

> **Gaskets and O-rings must be replaced with new ones to prevent fuel leakage.**

REMOUNTING

- Remount the fuel tank and fuel valve in the reverse order of removal.

CARBURETOR

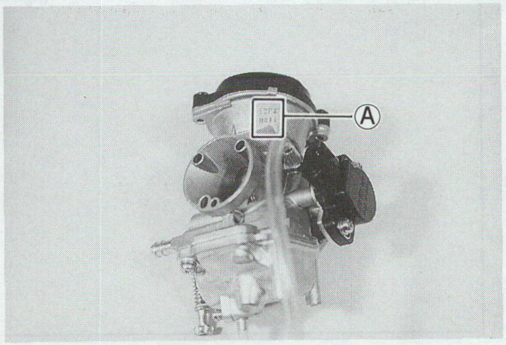
SPECIFICATIONS

ITEM	SPECIFICATION		
	E-02, 04, 25, 34	E-17, 22	E-22 (U-type)
Carburetor type	MIKUNI BS26SS	←	←
Bore size	26 mm	←	←
I.D. No	12F0	12F2	12F3
Idle r/min.	1 500 ± 100 r/min.	←	←
Float height	17.1 ± 0.5 mm	←	←
Main jet (M.J.)	#110	←	←
Jet needle (J.N.)	5D97-54-4th	←	←
Needle jet (N.J.)	P-0	←	←
Pilot jet (P.J.)	#12.5	←	#15
Throttle valve (Th.V.)	#105	#100	←
Pilot screw (P.S.)	$1^{5}/_{8}$ turns out	$2^{1}/_{4}$ turns out	$1^{1}/_{8}$ turns out
Throttle cable play	3–6 mm (0.12–0.24 in)	←	←
Starter plunger cable play	0.5–1.0 mm (0.02–0.04 in)	←	←

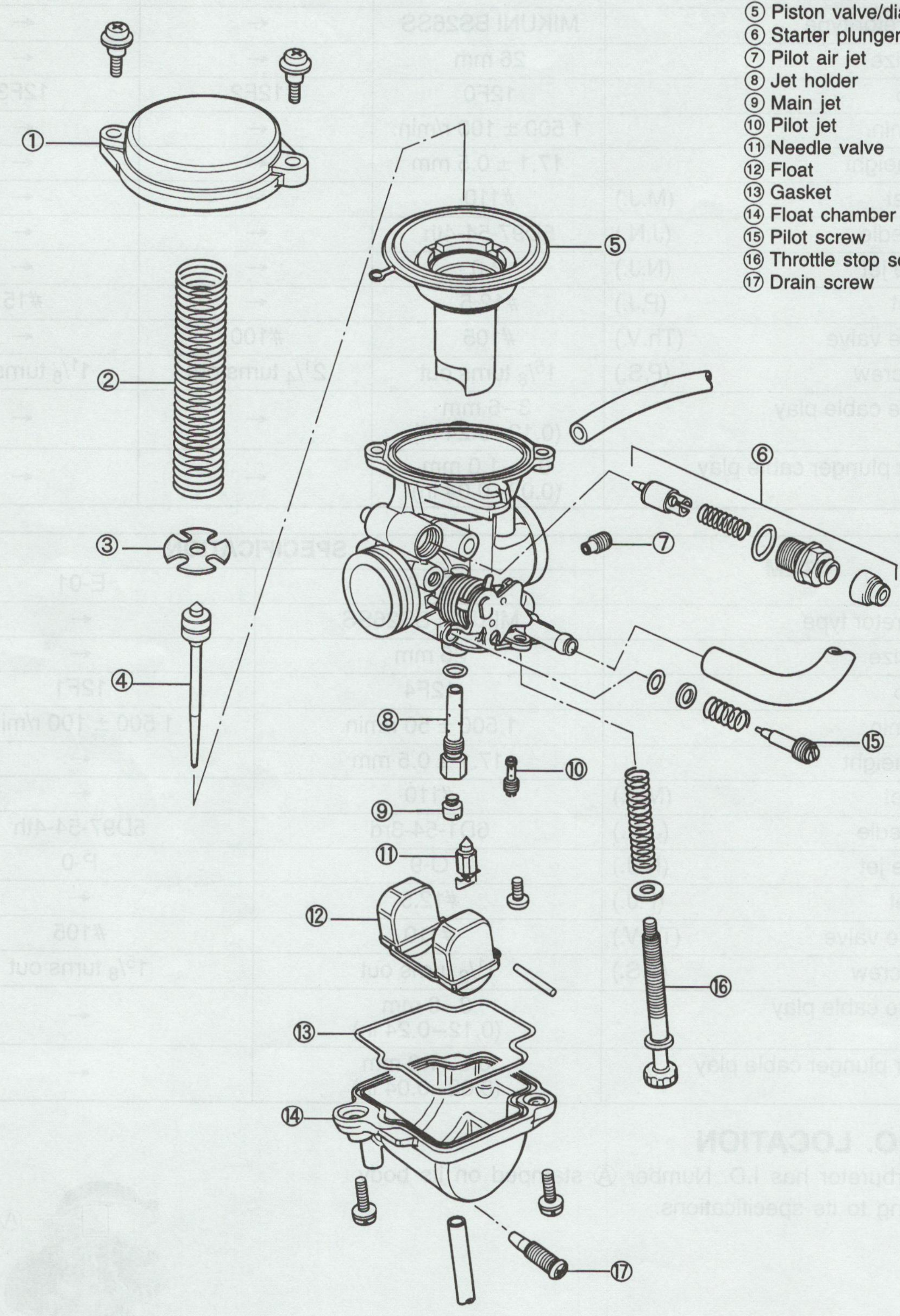
ITEM	SPECIFICATION	
	E-18	E-01
Carburetor type	MIKUNI BS26SS	←
Bore size	26 mm	←
I.D. No	12F4	12F1
Idle r/min.	1 500 ± 50 r/min.	1 500 ± 100 r/min.
Float height	17.1 ± 0.5 mm	←
Main jet (M.J.)	#110	←
Jet needle (J.N.)	6D1-54-3rd	5D97-54-4th
Needle jet (N.J.)	O-9	P-0
Pilot jet (P.J.)	#12.5	←
Throttle valve (Th.V.)	#110	#105
Pilot screw (P.S.)	$1^{1}/_{2}$ turns out	$1^{5}/_{8}$ turns out
Throttle cable play	3–6 mm (0.12–0.24 in)	←
Starter plunger cable play	0.5–1.0 mm (0.02–0.04 in)	←

I.D. NO. LOCATION

The carburetor has I.D. Number Ⓐ stamped on its body according to its specifications.



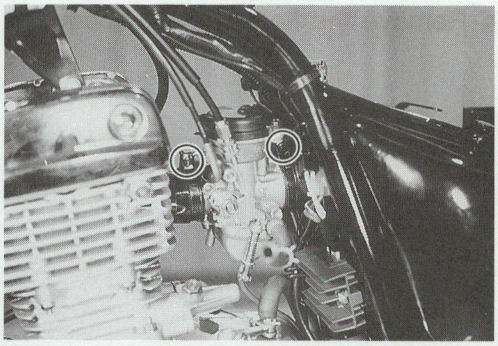
CONSTRUCTION



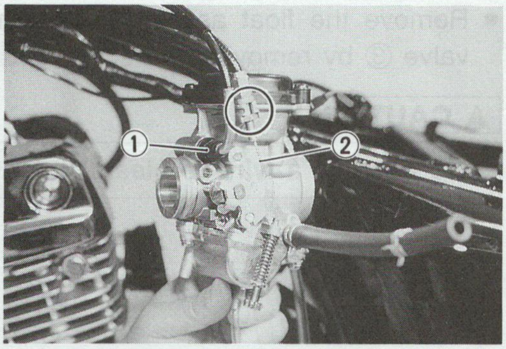
① Top cap
② Spring
③ Spring seat
④ Jet needle
⑤ Piston valve/diaphragm
⑥ Starter plunger
⑦ Pilot air jet
⑧ Jet holder
⑨ Main jet
⑩ Pilot jet
⑪ Needle valve
⑫ Float
⑬ Gasket
⑭ Float chamber
⑮ Pilot screw
⑯ Throttle stop screw
⑰ Drain screw

REMOVAL

- Remove the fuel tank. (See p. 4-1.)
- Loosen the clamp screws.
- Remove the carburetor.

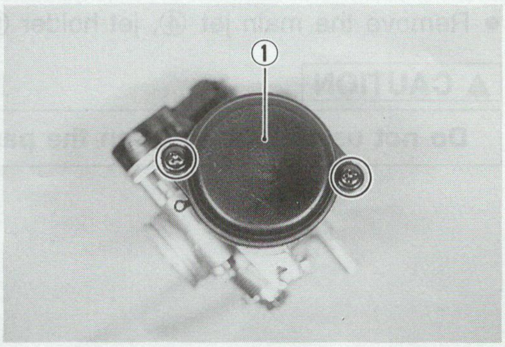


- Remove the starter plunger ① and throttle cable ②.

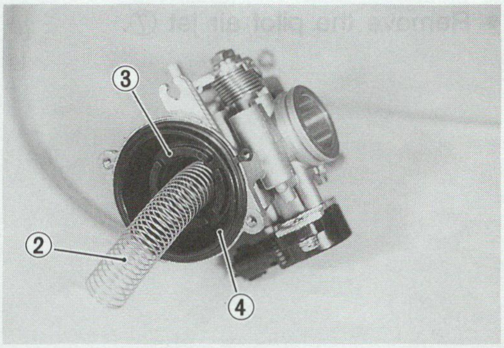


DISASSEMBLY

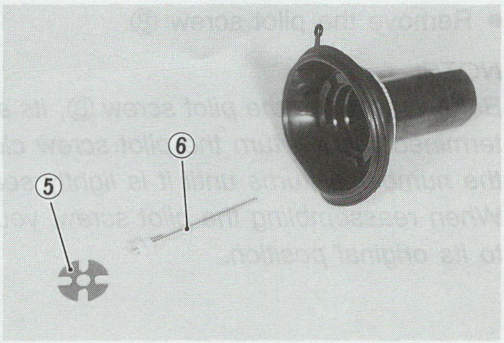
- Remove the carburetor top cap ①.



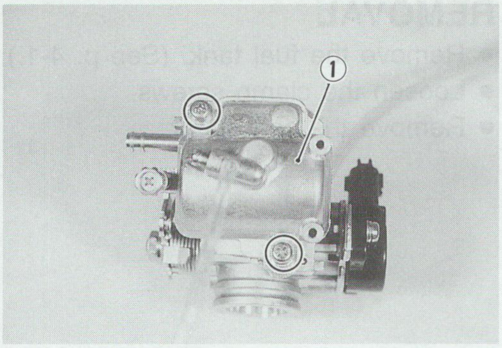
- Remove the spring ② and piston valve ③ along with diaphragm ④.



- Remove the spring seat ⑤ and jet needle ⑥.



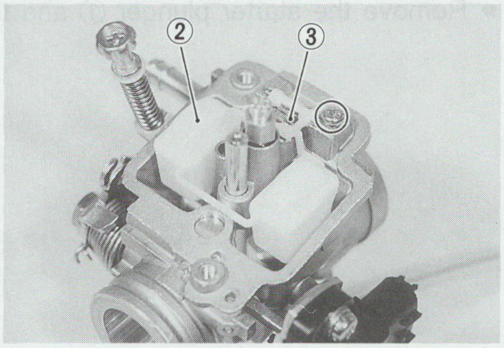
- Remove the float chamber body ①.



- Remove the float assembly ② along with the needle valve ③ by removing the screw and pin.

⚠ CAUTION

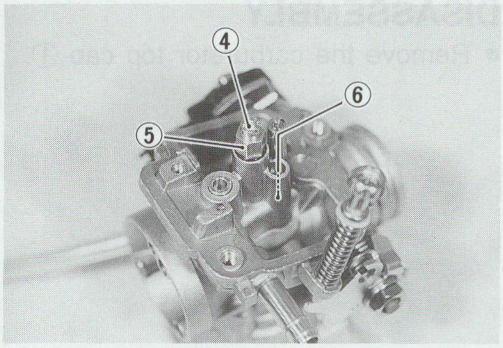
Do not use a wire to clean the valve seat.



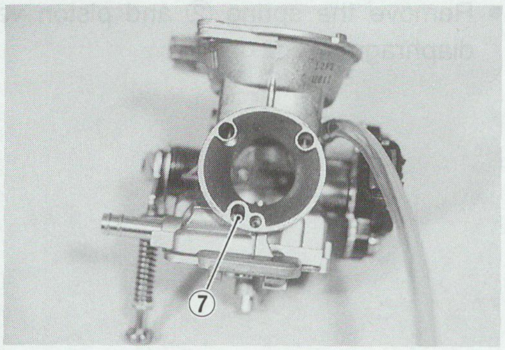
- Remove the main jet ④, jet holder ⑤ and pilot jet ⑥.

⚠ CAUTION

Do not use a wire to clean the passage and jets.

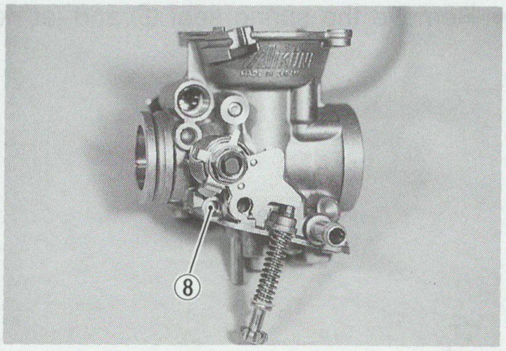


- Remove the pilot air jet ⑦.

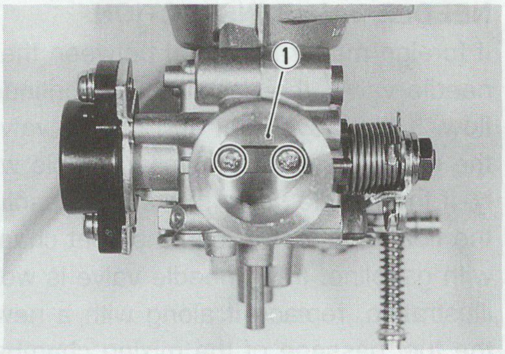


- Remove the pilot screw ⑧.

NOTE:
Before removing the pilot screw ⑧, its setting must be determined. Slowly turn the pilot screw clockwise and count the number of turns until it is lightly seated.
When reassembling the pilot screw, you will want to set it to its original position.



- Remove the throttle valve ① by removing the screws.

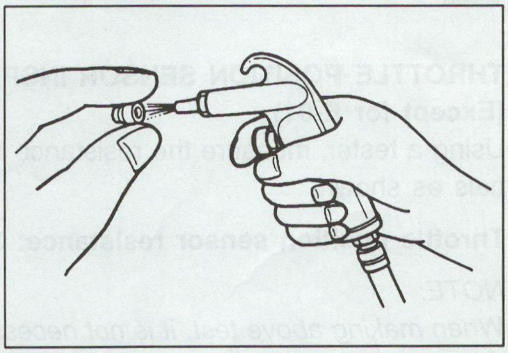


CLEANING

⚠WARNING

Some carburetor cleaning chemicals, especially dip-type soaking solutions, are very corrosive and must be handled carefully. Always follow the chemical manufacturer's instructions on proper use, handling and storage.

- Clean all jets with a spray-type carburetor cleaner and dry them using compressed air.
- Clean all circuits of the carburetor thoroughly – not just the perceived problem area. Clean the circuits in the carburetor body with a spray-type cleaner and allow each circuit to soak, if necessary, to loosen dirt and varnish. Blow the body dry using compressed air.



⚠ CAUTION

Do not use a wire to clean the jets or passageways. A wire can damage the jets and passageways. If the components cannot be cleaned with a spray cleaner it may be necessary to use a dip-type cleaning solution and allow them to soak. Always follow the chemical manufacturer's instructions for proper use and cleaning of the carburetor components.

- After cleaning, reassemble the carburetor with new seals and gaskets.

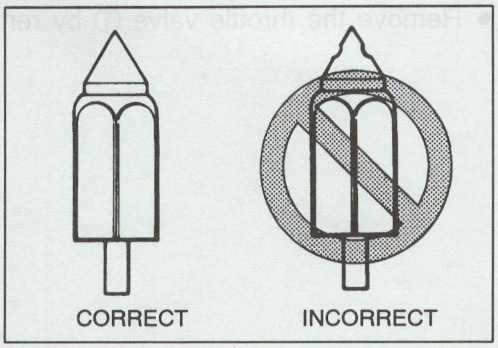
INSPECTION AND ADJUSTMENT

Check the following items for any damage or clogging.

- * Pilot jet
- * Main jet
- * Pilot screw
- * Needle jet air bleeding hole
- * Float
- * Needle valve
- * Gasket and O-ring
- * Pilot outlet and by-pass holes

NEEDLE VALVE INSPECTION

If foreign matter is caught between the valve seat and the needle valve, the gasoline will continue flowing and overflow. If the valve seat and needle valve are worn beyond the permissible limits, similar trouble will occur. Conversely, if the needle valve sticks, the gasoline will not flow into the float chamber. Clean the float chamber and float parts with gasoline. If the needle valve is worn, as shown in the illustration, replace it along with a new valve seat. Clean the fuel passage of the mixing chamber with compressed air.

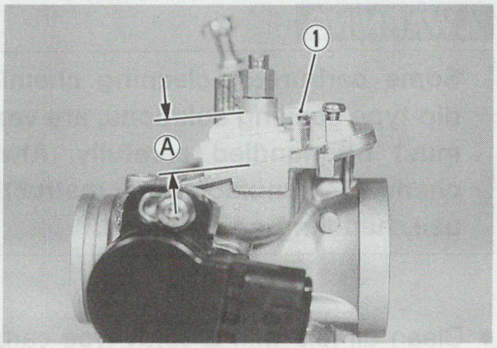


FLOAT HEIGHT ADJUSTMENT

To check the float height, turn the carburetor upside down. Measure the float height Ⓐ while the float arm is just contacting the needle valve using vernier calipers. Bend the tongue ① as necessary to bring the float height Ⓐ to the specified value.

Float height Ⓐ: 17.1 ± 0.5 mm (0.67 ± 0.02 in)

TOOL 09900-20102: Vernier calipers

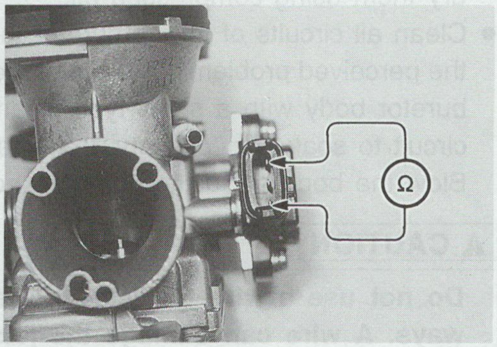


THROTTLE POSITION SENSOR INSPECTION (Except for E-01)

Using a tester, measure the resistance between the terminals as shown.

Throttle position sensor resistance: 3.5–6.5 kΩ

NOTE:
When making above test, it is not necessary to remove the throttle position sensor.



REASSEMBLY

Reassemble the carburetor in the reverse order of disassembly.

Pay attention to the following points:

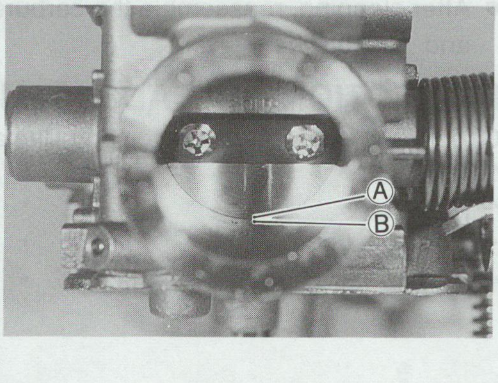
- Turn the throttle stop screw until the throttle valve's bottom end Ⓐ is aligned with the foremost by-pass Ⓑ.

NOTE:
Apply a small quantity of THREAD LOCK "1342" to the throttle valve mounting screws and tighten them.

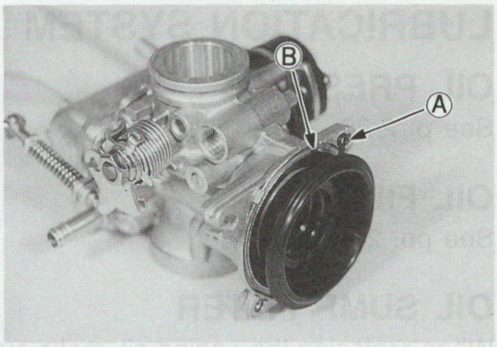
1342 99000-32050: THREAD LOCK "1342"

⚠ CAUTION

Face the stamped side of the throttle valve out.



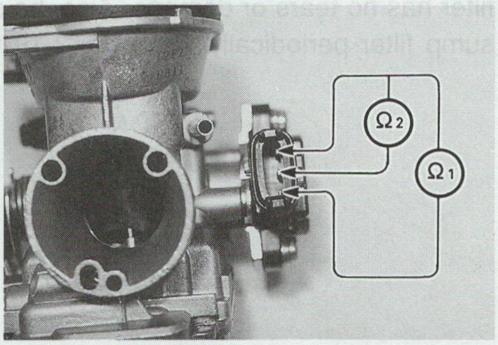
- Align the projection Ⓐ of the diaphragm with the groove Ⓑ of the carburetor body.



THROTTLE POSITION SENSOR POSITIONING
(Except for E-01)

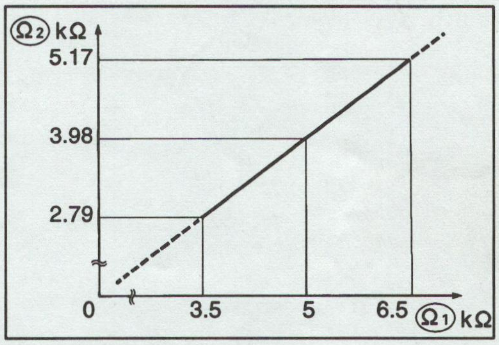
If removing the throttle position sensor from the carburetor body, install it to the exact position mentioned below;

- Measure the resistance Ω_1 between terminals of the throttle position sensor as shown.



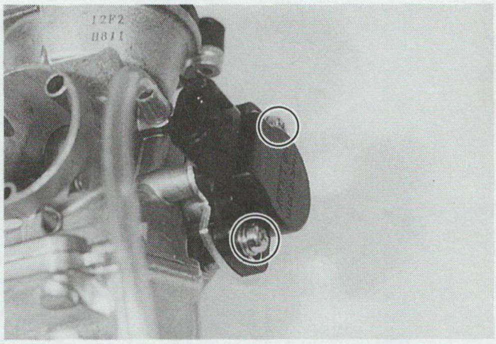
Throttle position sensor resistance Ω_1: 3.5–6.5 kΩ

- Measure the resistance Ω_2 between terminals of the throttle position sensor as shown in the right illustration.
- Open the throttle valve fully by turning the throttle lever.
- Under above condition, see the throttle position sensor angle to have the resistance Ω_2 as 79.6% of the resistance Ω_1.



For example: When Ω_1 is 5 kΩ, Ω_2 should be 3.98 kΩ.

- When reading the above-mentioned resistance as Ω_2, tighten the throttle position sensor mounting screws to the specified torque.



Throttle position sensor mounting screw:
3.5 N·m (0.35 kg-m, 2.5 lb-ft)

REMOUNTING

Remount the carburetor in the reverse order of removal.

- Adjust the following items to the specification.

* Engine idle r/min .... See p. 2-7.
* Throttle cable play .... See p. 2-7.
* Starter plunger cable play .... See p. 2-8.

LUBRICATION SYSTEM

OIL PRESSURE

See p. 2-20.

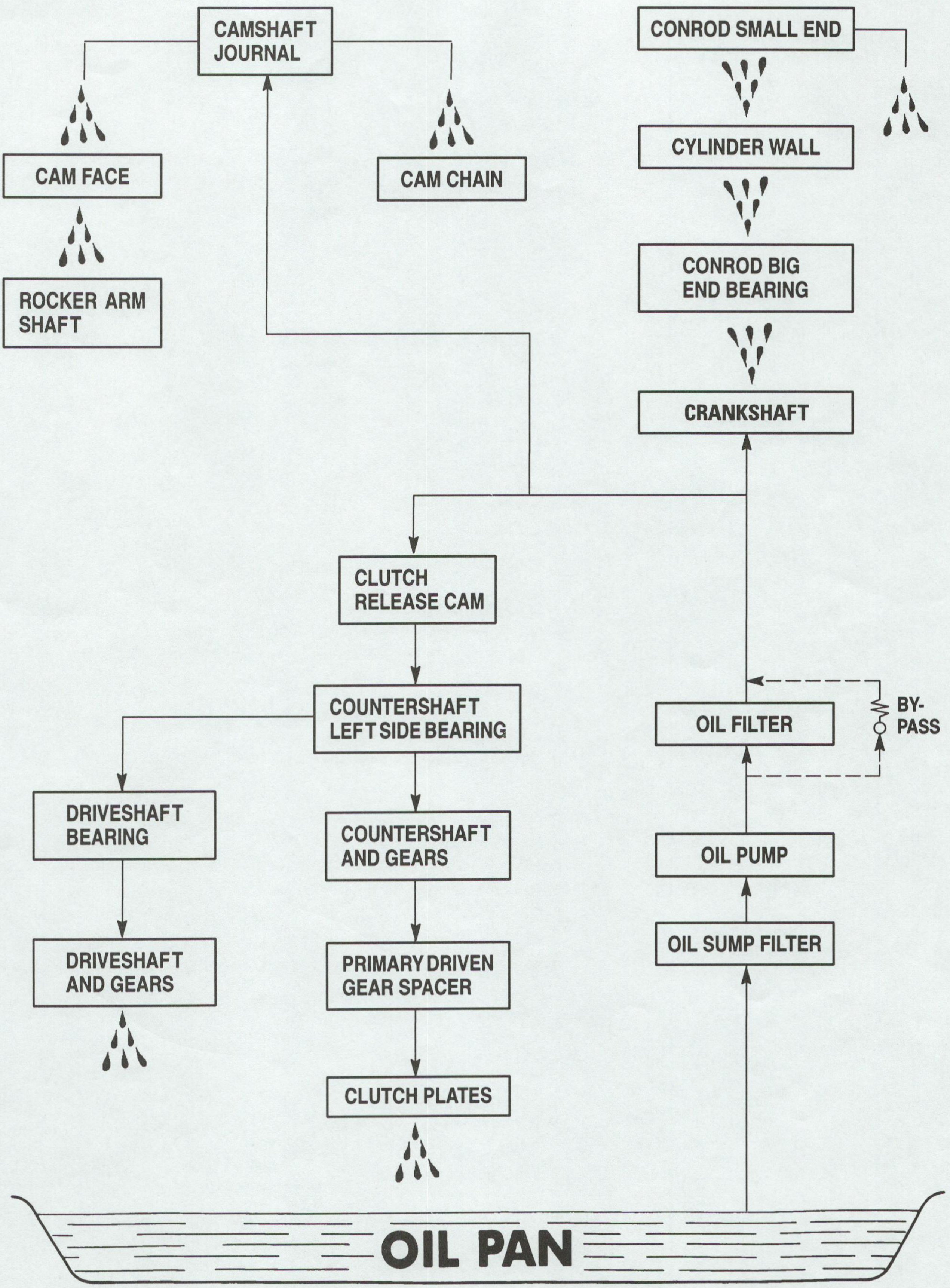
OIL FILTER

See pp. 2-9 and -10.

OIL SUMP FILTER

When replacing the engine oil, make sure that the oil sump filter has no tears or damage. Also, be sure to clean the oil sump filter periodically. (See pp. 3-19 to -45.)

ENGINE LUBRICATION SYSTEM CHART


CAMSHAFT JOURNAL
CONROD SMALL END
CAM FACE
CAM CHAIN
CYLINDER WALL
ROCKER ARM SHAFT
CONROD BIG END BEARING
CRANKSHAFT
CLUTCH RELEASE CAM
COUNTERSHAFT LEFT SIDE BEARING
OIL FILTER
BY-PASS
DRIVESHAFT BEARING
COUNTERSHAFT AND GEARS
OIL PUMP
DRIVESHAFT AND GEARS
PRIMARY DRIVEN GEAR SPACER
OIL SUMP FILTER
CLUTCH PLATES
OIL PAN

CHASSIS

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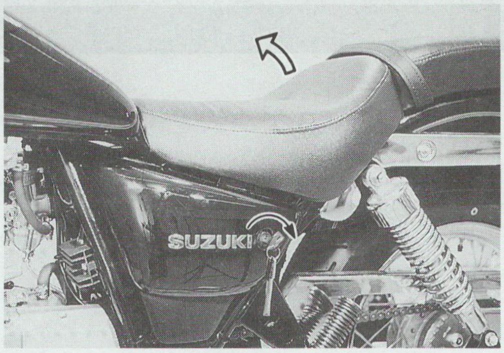
EXTERIOR PARTS

REMOVAL

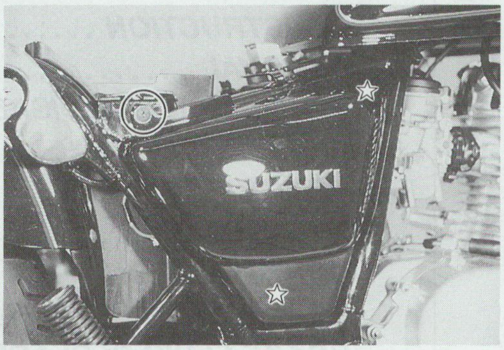
FRONT SEAT

- Remove the seat with the ignition key.



RIGHT FRAME COVER

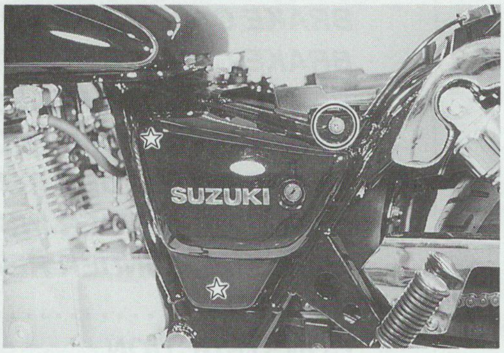
- Remove the screw.
- Remove the right frame cover.



☆ hooked part

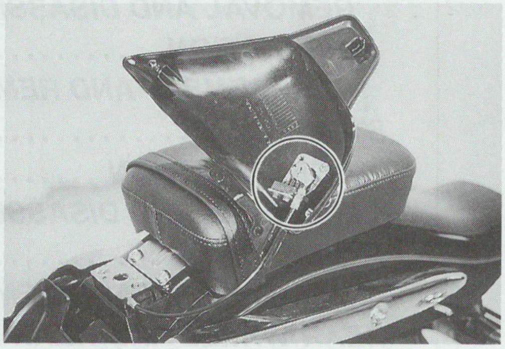
LEFT FRAME COVER

- Remove the screw.
- Remove the left frame cover.



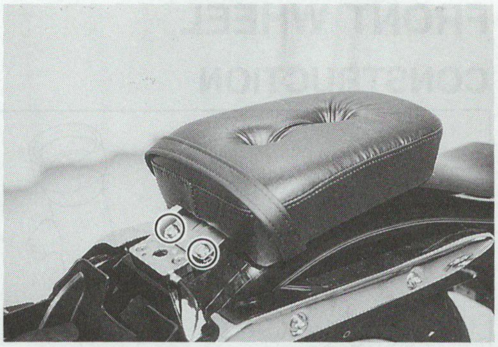
☆ hooked part

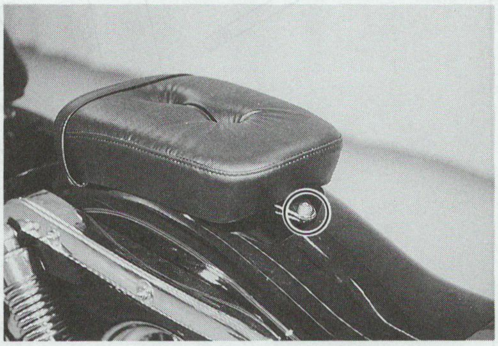
- Disconnect the seat lock cable.



REAR SEAT

- Remove the rear seat by removing the bolts.



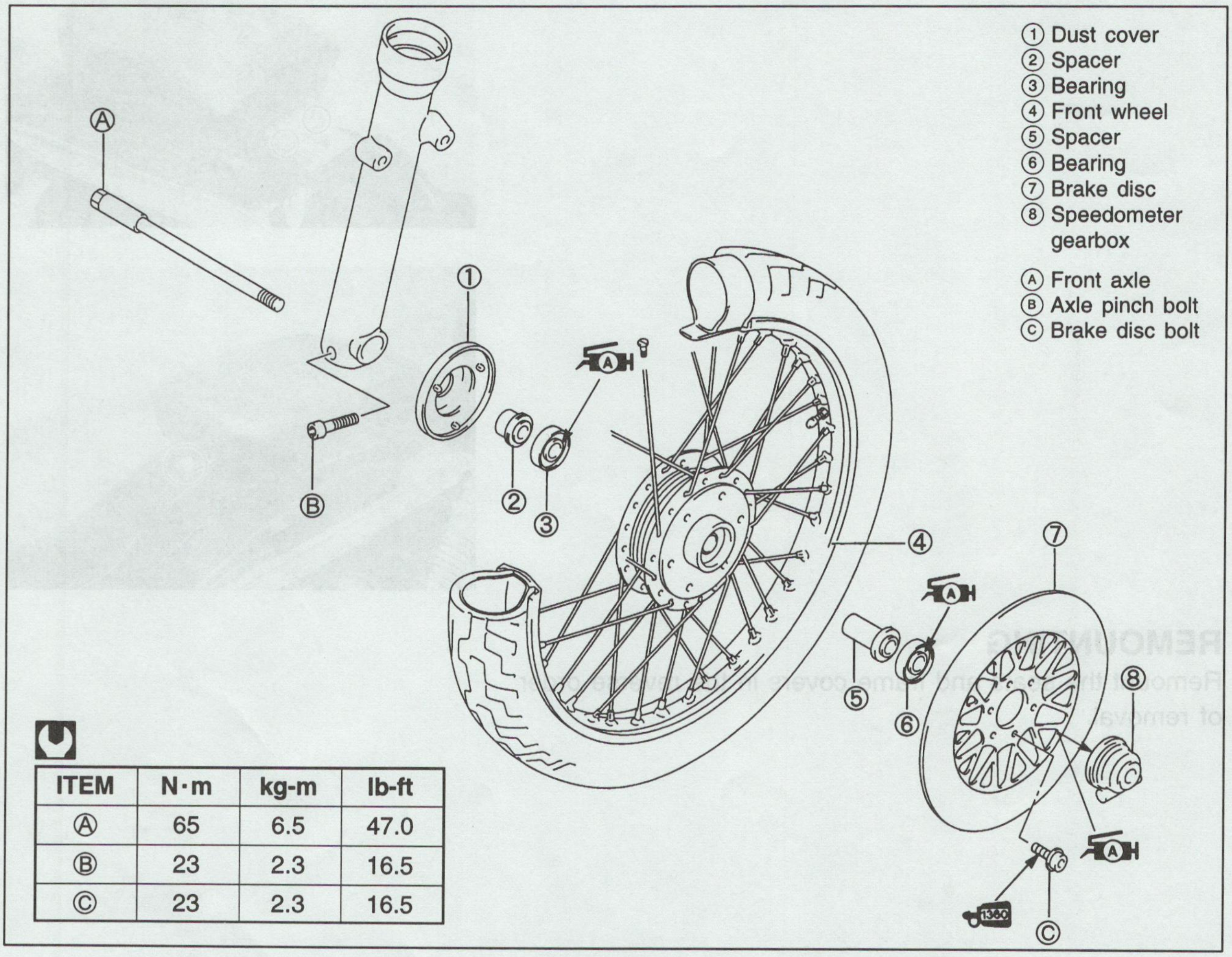


REMOUNTING

Remount the seats and frame covers in the reverse order of removal.

FRONT WHEEL

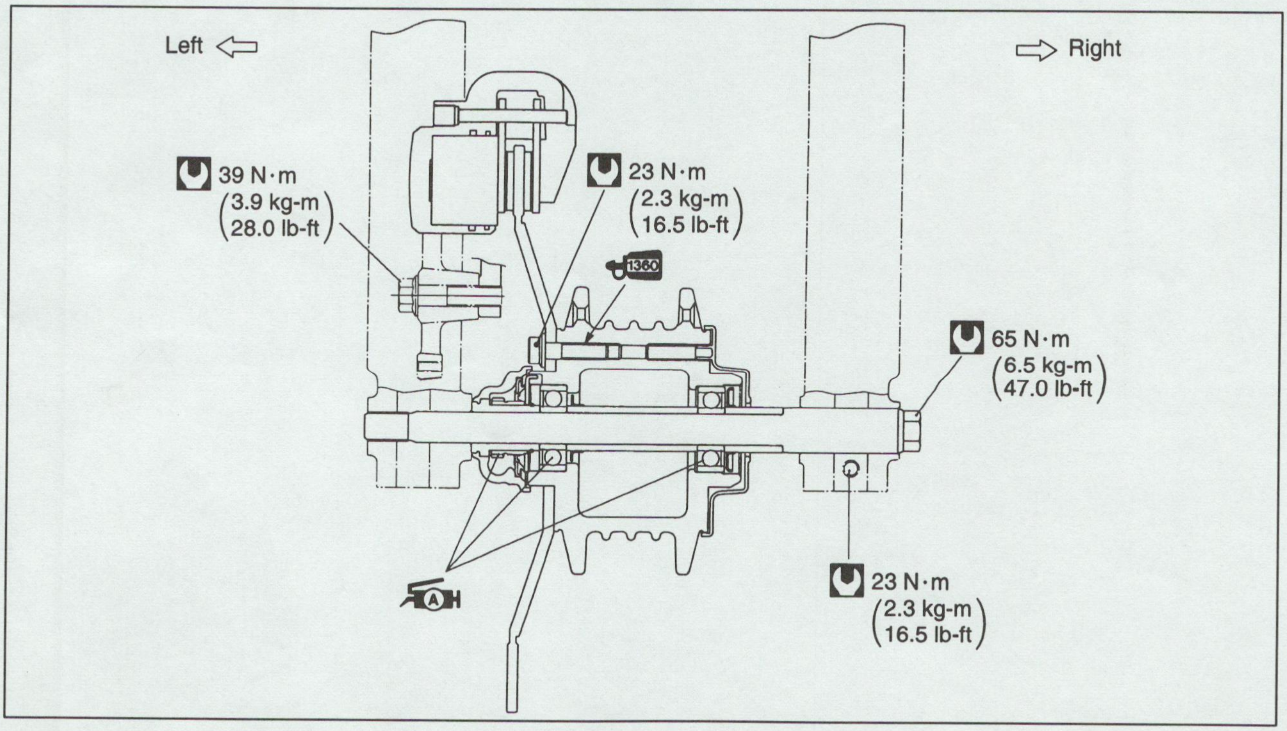
CONSTRUCTION


Ⓐ
Ⓑ
①
②
③
④
⑤
⑥
⑦
⑧
Ⓒ
Ⓐ
1360

① Dust cover
② Spacer
③ Bearing
④ Front wheel
⑤ Spacer
⑥ Bearing
⑦ Brake disc
⑧ Speedometer gearbox

Ⓐ Front axle
Ⓑ Axle pinch bolt
Ⓒ Brake disc bolt

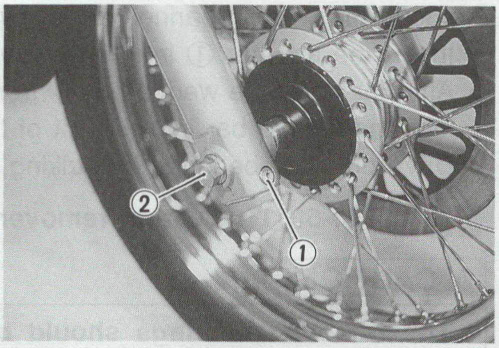
ITEM	N·m	kg-m	lb-ft
Ⓐ	65	6.5	47.0
Ⓑ	23	2.3	16.5
Ⓒ	23	2.3	16.5


Left
Right
39 N·m (3.9 kg-m 28.0 lb-ft)
23 N·m (2.3 kg-m 16.5 lb-ft)
1360
65 N·m (6.5 kg-m 47.0 lb-ft)
Ⓐ
23 N·m (2.3 kg-m 16.5 lb-ft)

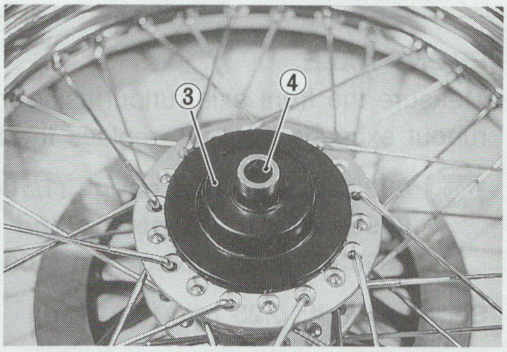
REMOVAL

FRONT WHEEL

- Loosen the axle pinch bolt ①.
- Loosen the front axle ②.
- Raise the front wheel off the ground with a jack or wooden block.
- Remove the front wheel by removing the front axle ②.

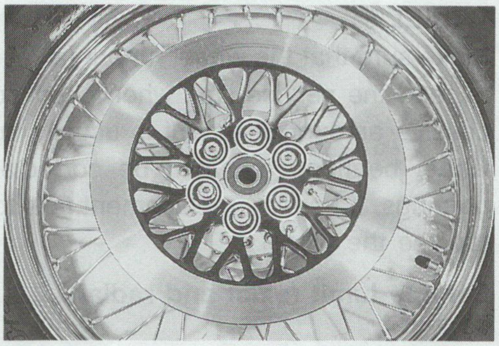


- Remove the dust cover ③ and spacer ④.



- Remove the brake disc.

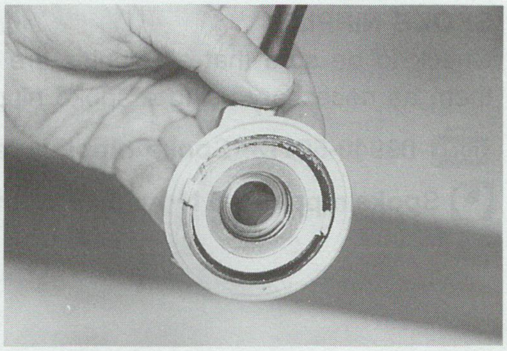
TOOL 09900-00410: Hexagon wrench set



INSPECTION AND DISASSEMBLY

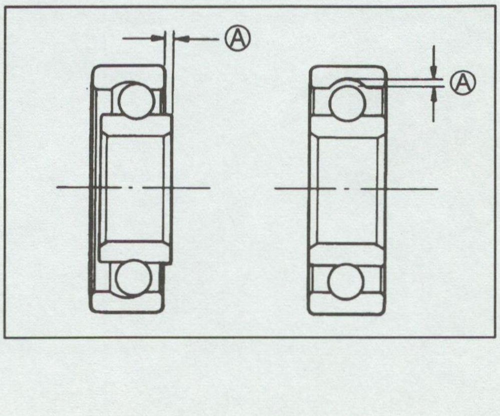
SPEEDOMETER GEARBOX

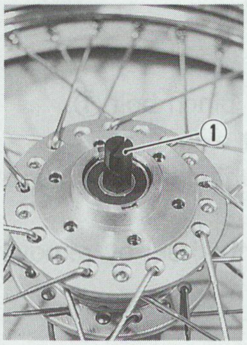
Turn the speedometer gear and check to see that the gear turns smoothly together with the speedometer pinion.

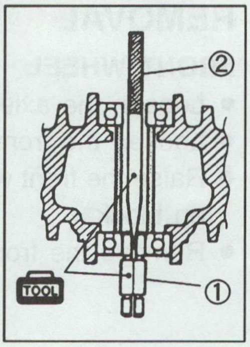


WHEEL BEARINGS

Inspect the play Ⓐ of the wheel bearings by hand while they are in the wheel. Rotate the inner race by hand to inspect it for abnormal noise and smooth rotation. Replace the wheel bearings if there is anything unusual.







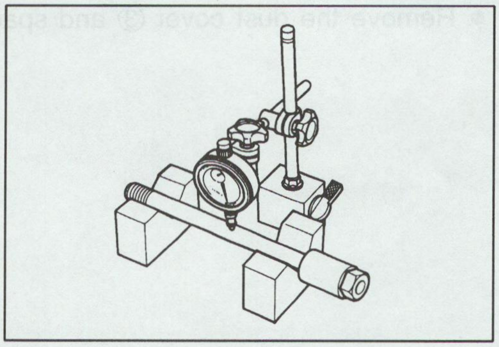
Remove the wheel bearings as follows:

- Insert the adapter ① into the wheel bearing.
- After inserting the wedge bar ② from the opposite side, lock the wedge bar into the slit of the adapter.
- Drive out both bearings by striking the wedge bar.

TOOL **09941-50111: Bearing remover**

▲ CAUTION

The removed bearings should be replaced with new ones.

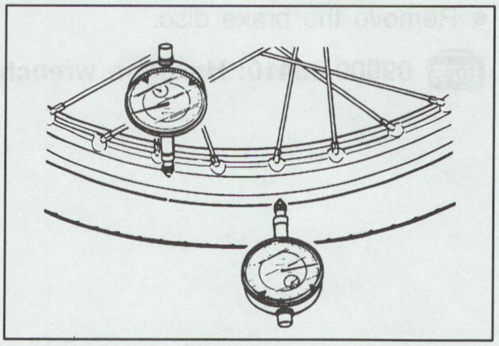


FRONT AXLE

Measure the front axle runout using the dial gauge. If the runout exceeds the limit, replace the front axle.

TOOL **09900-20606: Dial gauge (1/100)**
09900-20701: Magnetic stand
09900-21304: V-block set (100 mm)

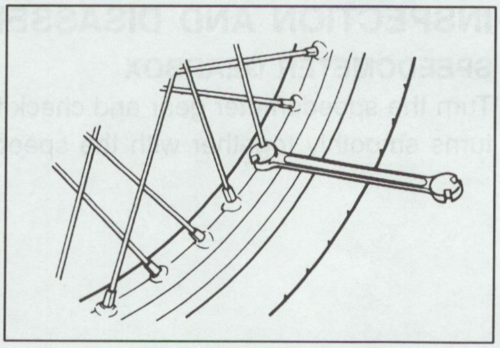
Service Limit: 0.25 mm (0.010 in)



WHEEL

Make sure that the wheel runout (axial and radial) does not exceed the service limit when checked as shown. An excessive amount of runout is usually due to worn or loose wheel bearings and can be corrected by replacing the bearings. If bearing replacement fails to reduce the runout, replace the wheel.

Service Limit (axial and radial): 2.0 mm (0.08 in)



SPOKE NIPPLE

Check to be sure that all nipples are tight, and retighten them as necessary using a spoke nipple wrench.

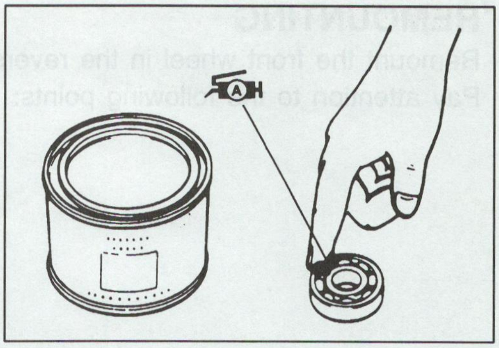
TOOL **09940-60113: Spoke nipple wrench**

Spoke nipple: 4.5 N·m (0.45 kg-m, 3.5 lb-ft)

REASSEMBLY

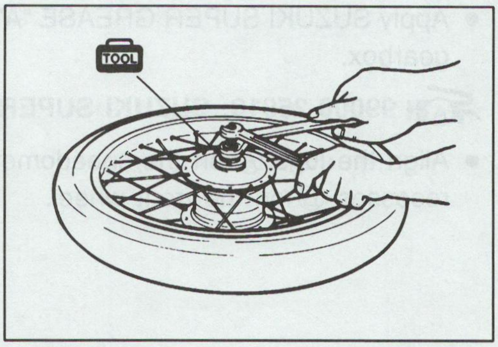
- Apply SUZUKI SUPER GREASE "A" to the bearings before installing.

99000-25010: SUZUKI SUPER GREASE "A"



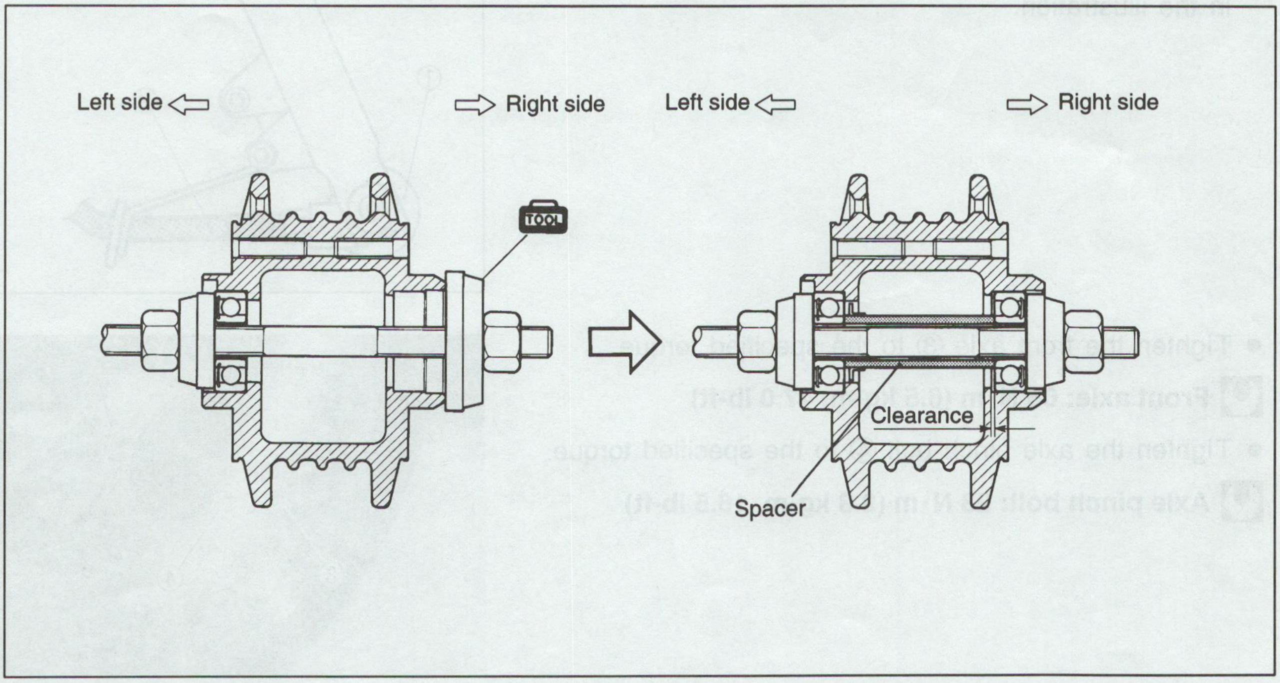
- Install the wheel bearings using the special tools as described below.

09924-84510: Bearing installer set
09924-84521: Bearing installer set



▲ CAUTION

*** First install the left wheel bearing, then install the right wheel bearing.**
*** The sealed cover on the bearings must face to the outside.**

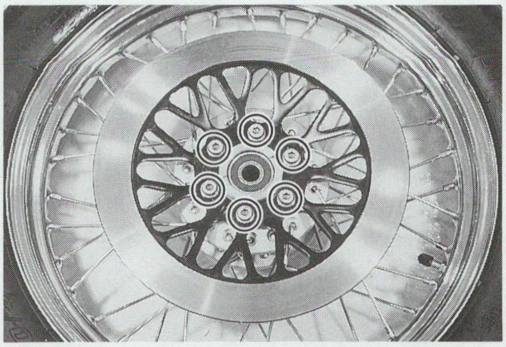

Left side
Right side
TOOL
Left side
Right side
Clearance
Spacer

BRAKE DISC

- Make sure that the brake disc is clean and free of any grease. Apply THREAD LOCK SUPER "1360" to the brake disc bolts and tighten them to the specified torque.

99000-32130: THREAD LOCK SUPER "1360"

Brake disc bolt: 23 N·m (2.3 kg-m, 16.5 lb-ft)



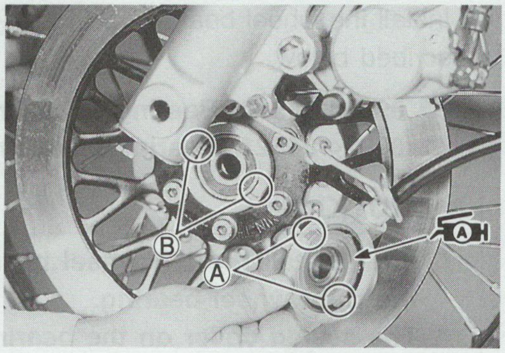
REMOUNTING

Remount the front wheel in the reverse order of removal. Pay attention to the following points:

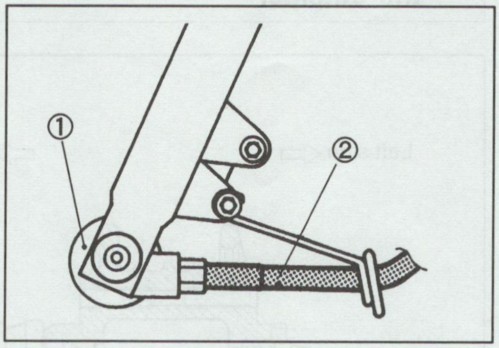
- Apply SUZUKI SUPER GREASE "A" to the speedometer gearbox.

99000-25010: SUZUKI SUPER GREASE "A"

- Align the lugs Ⓐ on the speedometer gearbox with the recesses Ⓑ on the front wheel.



- Set the speedometer gearbox ① with cable ② as shown in the illustration.

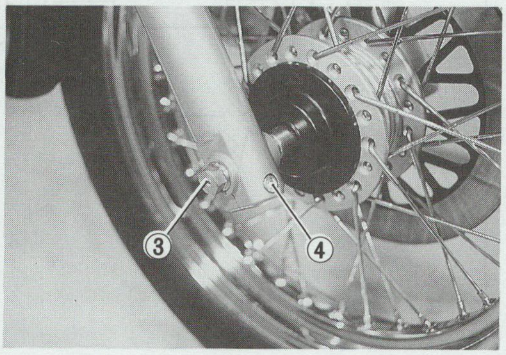


- Tighten the front axle ③ to the specified torque.

Front axle: 65 N·m (6.5 kg-m, 47.0 lb-ft)

- Tighten the axle pinch bolt ④ to the specified torque.

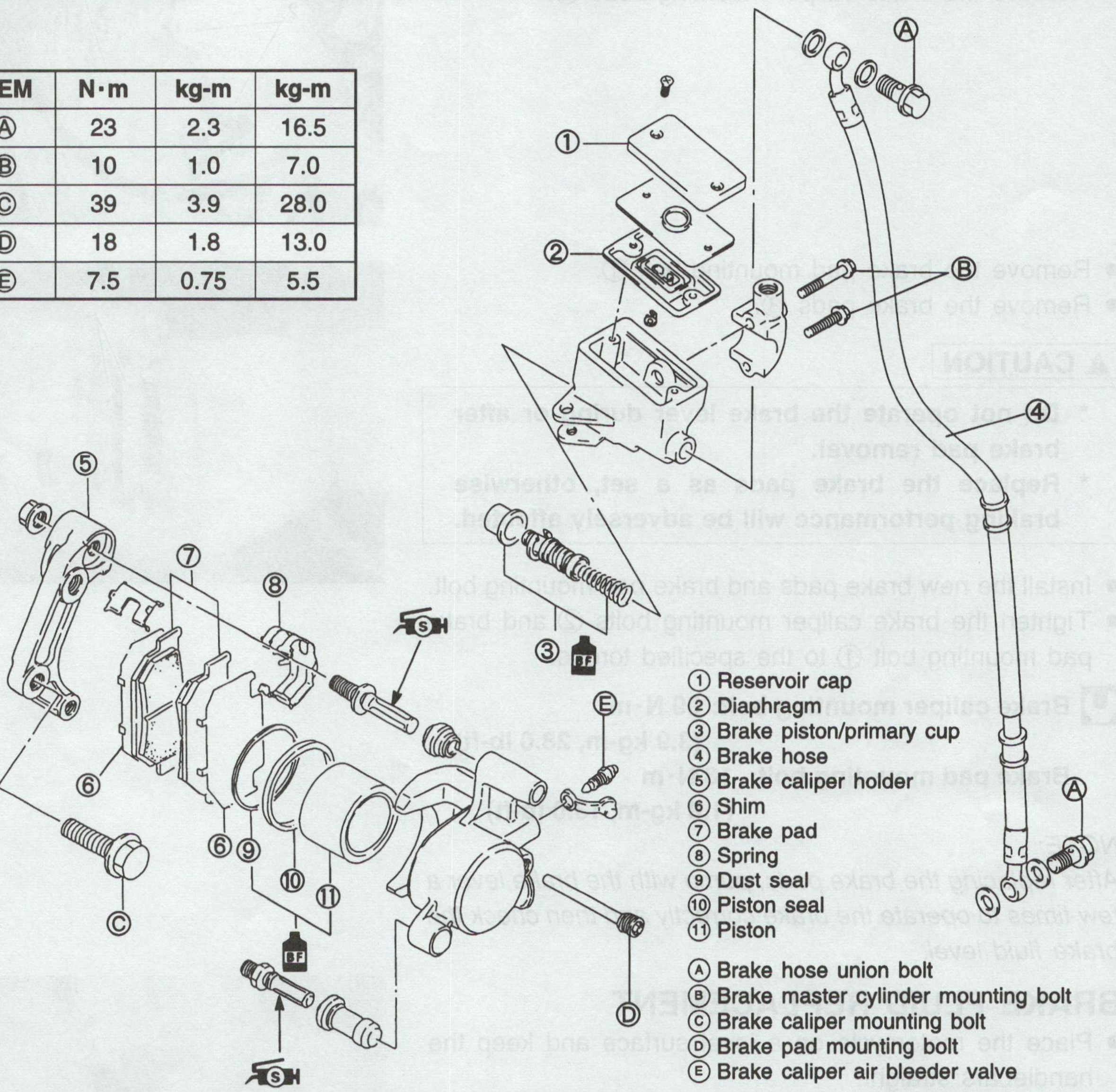
Axle pinch bolt: 23 N·m (2.3 kg-m, 16.5 lb-ft)



FRONT BRAKE

CONSTRUCTION

ITEM	N·m	kg-m	kg-m
Ⓐ	23	2.3	16.5
Ⓑ	10	1.0	7.0
Ⓒ	39	3.9	28.0
Ⓓ	18	1.8	13.0
Ⓔ	7.5	0.75	5.5



① Reservoir cap
② Diaphragm
③ Brake piston/primary cup
④ Brake hose
⑤ Brake caliper holder
⑥ Shim
⑦ Brake pad
⑧ Spring
⑨ Dust seal
⑩ Piston seal
⑪ Piston

Ⓐ Brake hose union bolt
Ⓑ Brake master cylinder mounting bolt
Ⓒ Brake caliper mounting bolt
Ⓓ Brake pad mounting bolt
Ⓔ Brake caliper air bleeder valve

▲WARNING

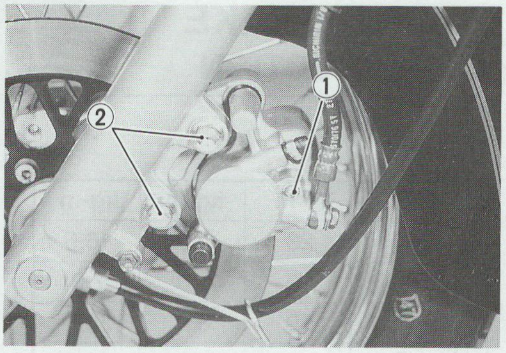
- *** This brake system is filled with an ethylene glycol-based DOT 4 brake fluid. Do not use or mix different types of fluid, such as silicone-based or petroleum-based brake fluids.**
- *** Do not use any brake fluid taken from old, used or unsealed containers. Never reuse brake fluid left over from the last servicing or which stored for long periods of time.**
- *** When storing the brake fluid, seal the container completely and keep it away from children.**
- *** When replenishing brake fluid, take care not to get dust into the fluid.**
- *** When washing brake components, use new brake fluid. Never use cleaning solvent.**
- *** A contaminated brake disc or brake pad reduces braking performance. Discard contaminated pads and clean the disc with high quality brake cleaner or a neutral detergent.**

▲ CAUTION

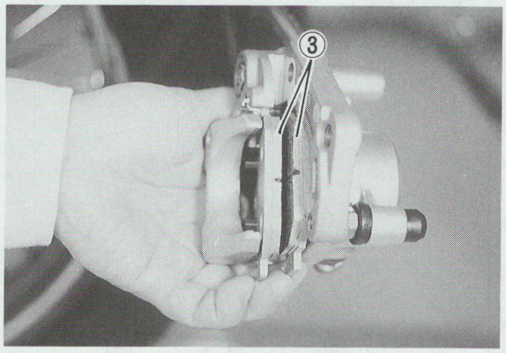
Handle brake fluid with care: the fluid reacts chemically with paint, plastics, rubber materials etc.

BRAKE PAD REPLACEMENT

- Loosen the brake pad mounting bolt ①.
- Remove the brake caliper mounting bolts ②.



- Remove the brake pad mounting bolt ①.
- Remove the brake pads ③.



⚠ CAUTION

- **Do not operate the brake lever during or after brake pad removal.**
- **Replace the brake pads as a set, otherwise braking performance will be adversely affected.**

- Install the new brake pads and brake pad mounting bolt.
- Tighten the brake caliper mounting bolts ② and brake pad mounting bolt ① to the specified torque.

Brake caliper mounting bolt: 39 N·m (3.9 kg-m, 28.0 lb-ft)

Brake pad mounting bolt: 18 N·m (1.8 kg-m, 13.0 lb-ft)

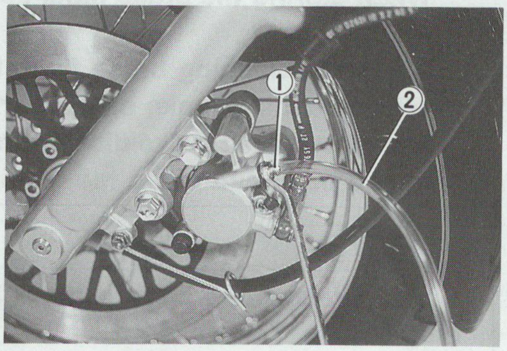
NOTE:
After replacing the brake pads, pump with the brake lever a few times to operate the brake correctly and then check the brake fluid level.

BRAKE FLUID REPLACEMENT

- Place the motorcycle on a level surface and keep the handlebars straight.
- Remove the master cylinder reservoir cap and diaphragm.
- Suck up the old brake fluid as much as possible.
- Fill the reservoir with new brake fluid.

Specification and Classification: DOT 4

- Connect a cleaner hose ② to the air bleeder valve ① and insert the free end of hose into a receptacle.
- Loosen the air bleeder valve and pump the brake lever until the old brake fluid is completely out of the brake system.
- Close the air bleeder valve and disconnect the clear hose. Fill the reservoir with new brake fluid to the upper end of the inspection window.

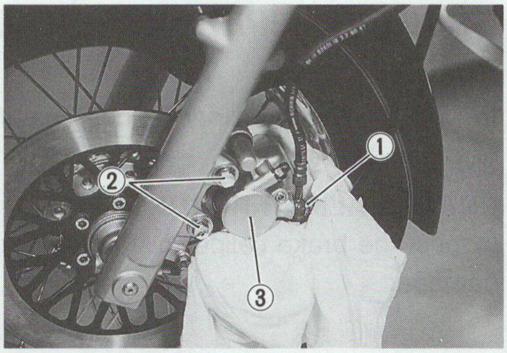


⚠ CAUTION

Bleed air from the brake system. (See p. 2-13.)

BRAKE CALIPER REMOVAL AND DISASSEMBLY

- Disconnect the brake hose from the brake caliper by removing the brake hose union bolt ① and allow the brake fluid to drain into a suitable receptacle.
- Loosen the brake pad mounting bolt.
- Remove the brake caliper ③ by removing the mounting bolts ②.



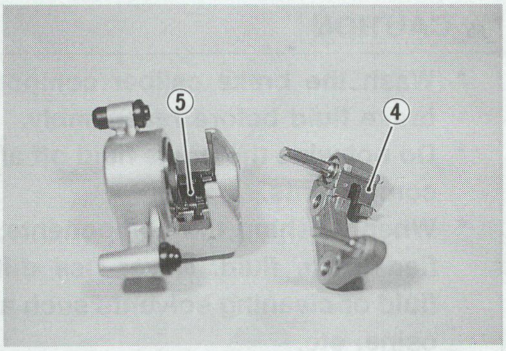
▲ CAUTION

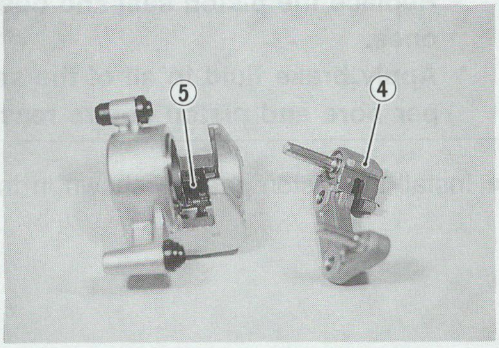
Never reuse the brake fluid left over from previous servicing and which has been stored for long periods of time.

▲WARNING

Brake fluid if it leaks, will interfere with safe running and discolor painted surfaces. Check the brake hose and hose joints for cracks and oil leakage.

- Remove the brake pads. (See p. 5-9.)
- Remove the brake caliper holder ④.
- Remove the spring ⑤.



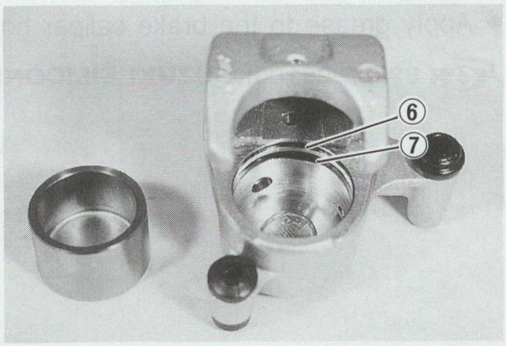


- Place a rag over the brake caliper piston to prevent it from popping out and then force out the piston using compressed air.

▲ CAUTION

Do not use high pressure air to prevent brake caliper piston damage.

- Remove the dust seal ⑥ and piston seal ⑦.



▲ CAUTION

Do not reuse the dust seal and piston seal to prevent brake fluid leakage.

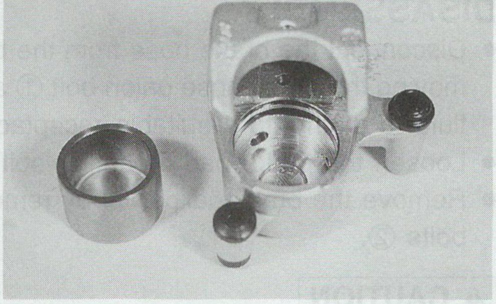
BRAKE CALIPER INSPECTION

BRAKE CALIPER

Inspect the brake caliper cylinder wall for nicks, scratches or other damage.

BRAKE CALIPER PISTONS

Inspect the brake caliper piston for any scratches or other damage.

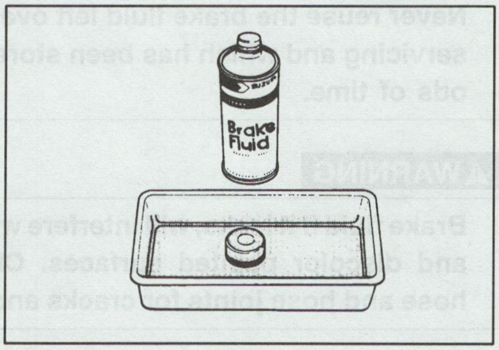


BRAKE CALIPER REASSEMBLY AND REMOUNTING

Reassemble and remount the brake caliper in the reverse order of removal and disassembly. Pay attention to the following points:

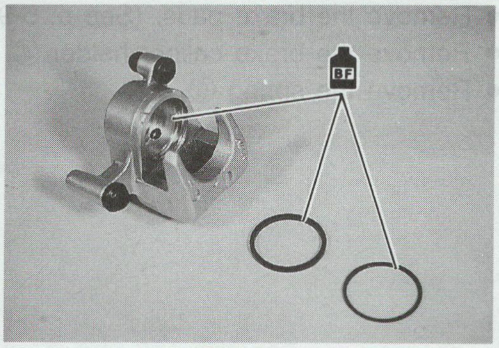
- Wash the caliper bore and piston with the specified brake fluid. Thoroughly wash the dust seal groove and piston seal groove.

BF **Specification and Classification: DOT 4**

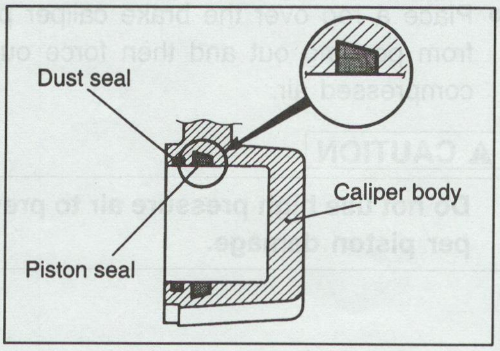


⚠ CAUTION

*** Wash the brake caliper components with new brake fluid before reassembly.**
*** Do not wipe the brake fluid off after washing the components.**
*** When washing the components, use the specified brake fluid. Never use different types of fluid or cleaning solvents such as gasoline, kerosine, etc.**
*** Replace the piston seal and dust seal with new ones.**
*** Apply brake fluid to all of the seals, brake caliper bore and piston before reassembly.**

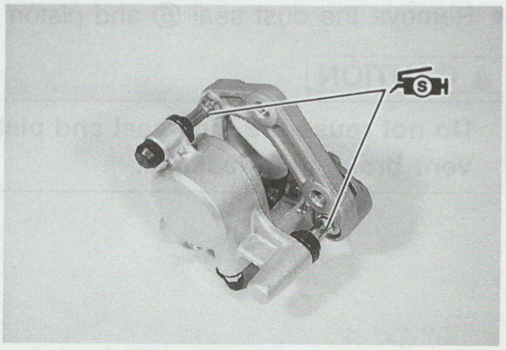


- Install the piston seal as shown in the illustration.

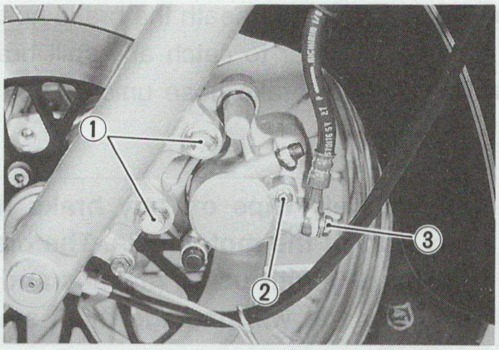


- Apply grease to the brake caliper holder.

S **99000-25100: SUZUKI SILICONE GREASE**



- Tighten the brake caliper mounting bolts ① and brake pad mounting bolt ② to the specified torque.
- Tighten the brake hose union bolt ③ to the specified torque.



Brake caliper mounting bolt ①:
39 N·m (3.9 kg-m, 28.0 lb-ft)
Brake pad mounting bolt ②: 18 N·m
(1.8 kg-m, 13.0 lb-ft)
Brake hose union bolt ③: 23 N·m
(2.3 kg-m, 16.5 lb-ft)

NOTE:
Before remounting the brake caliper, push the brake caliper piston all the way into the caliper.

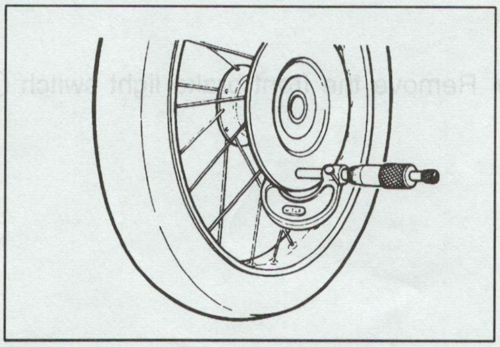
▲ CAUTION

Bleed air from the system after reassembling the brake caliper. (See p. 2-13.)

BRAKE DISC INSPECTION

- Remove the front wheel. (See p. 5-4.)

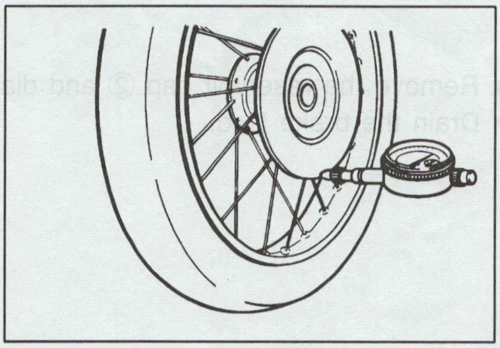
Check the brake disc for damage or cracks. Measure the thickness using the micrometer.
Replace the brake disc if the thickness is less than the service limit or if damage is found.



09900-20205: Micrometer (0–25 mm)

Service Limit
Brake disc thickness: 4.5 mm (0.18 in)

Measure the runout using the dial gauge.
Replace the brake disc if the runout exceeds the service limit.



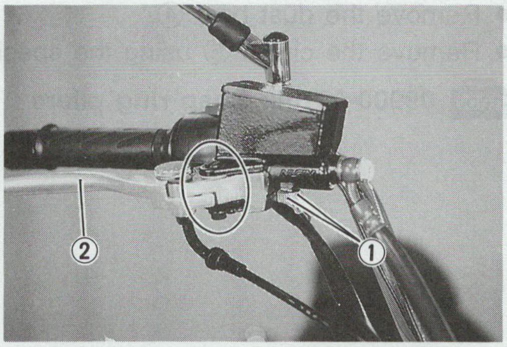
09900-20606: Dial gauge (1/100 mm)
09900-20701: Magnetic stand

Service Limit
Brake disc runout: 0.30 mm (0.012 in)

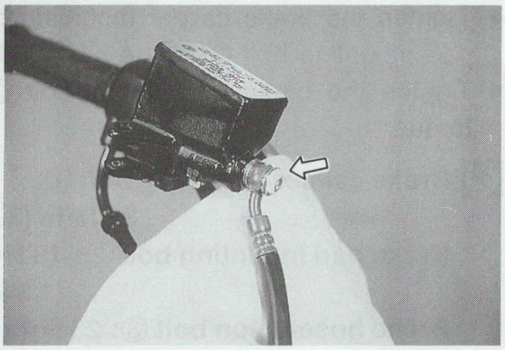
- If either measurement exceeds the service limit, replace the brake disc. (See pp. 5-4 and -6.)
- Install the front wheel. (See p. 5-7.)

MASTER CYLINDER REMOVAL AND DISASSEMBLY

- Disconnect the front brake light switch lead wires ①.
- Remove the brake lever ②.



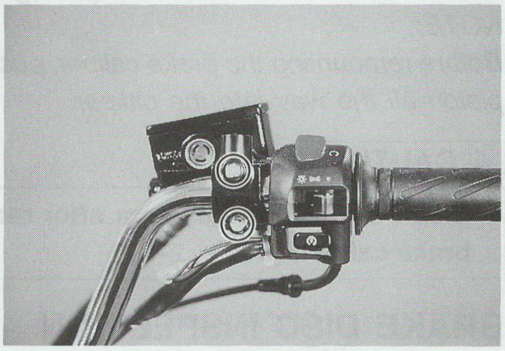
- Place a rag underneath the brake hose union bolt on the master cylinder to catch any spilt brake fluid.
- Remove the brake hose union bolt.



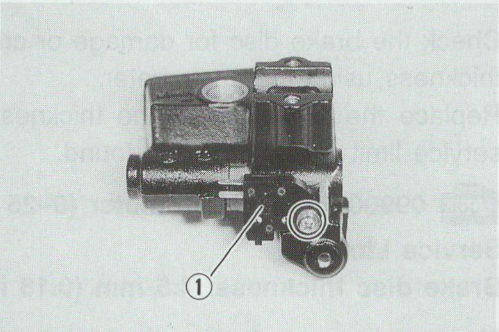
▲ CAUTION

Immediately wipe off any brake fluid contacting any part of the motorcycle. The brake fluid reacts chemically with paint, plastics and rubber materials, etc. and will damage them severely.

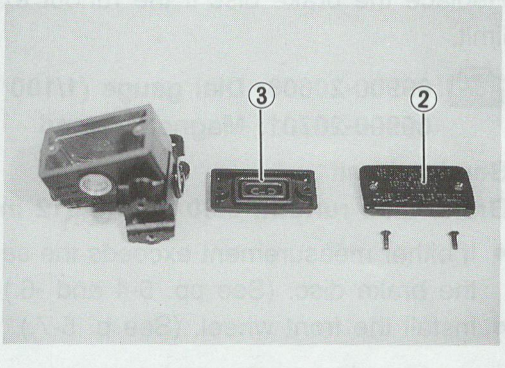
- Remove the master cylinder assembly.



- Remove the front brake light switch ①.

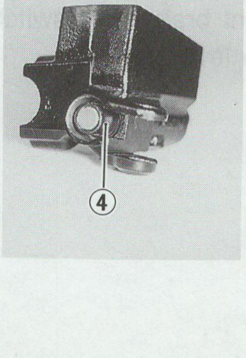


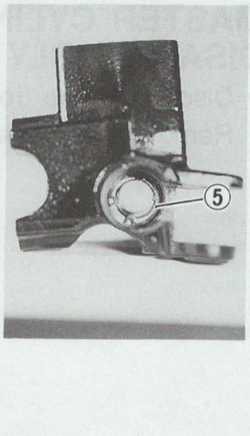
- Remove the reservoir cap ② and diaphragm ③.
- Drain the brake fluid.



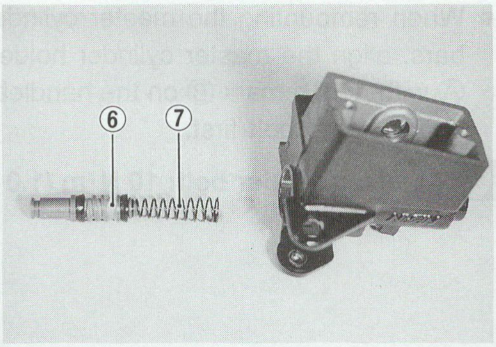
- Remove the dust boot ④.
- Remove the circlip ⑤ using the special tool.

TOOL 09900-06108: Snap ring pliers



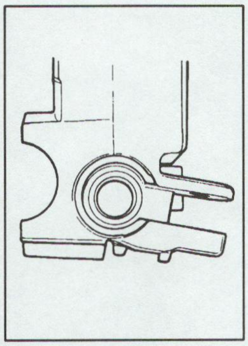


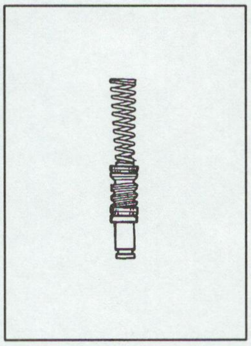
- Remove the piston/secondary cup ⑥ and return spring ⑦.



MASTER CYLINDER INSPECTION

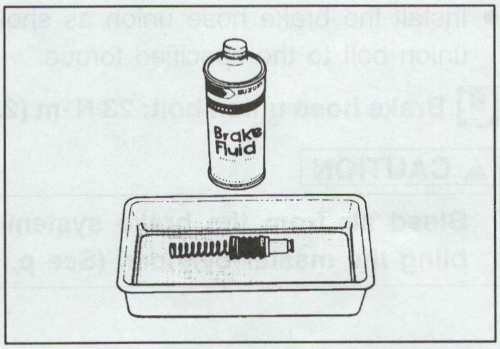
Inspect the master cylinder bore for any scratches or other damage.
Inspect the piston surface for any scratches or other damage.
Inspect the primary cup, secondary cup and dust seal for wear or damage.





MASTER CYLINDER REASSEMBLY AND REMOUNTING

Reassemble and remount the master cylinder in the reverse order of removal and disassembly. Pay attention to the following points:



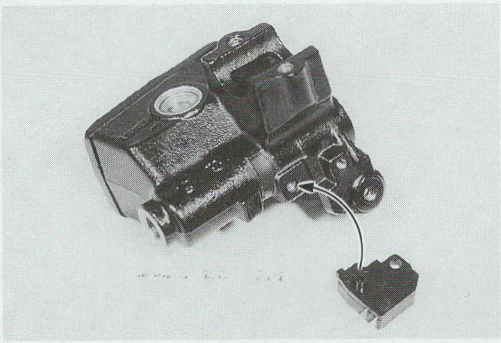
⚠ CAUTION

- **Wash the master cylinder components with new brake fluid before reassembly.**
- **Do not wipe the brake fluid off after washing the components.**
- **When washing the components, use the specified brake fluid. Never use different types of fluid or cleaning solvents such as gasoline, kerosine, etc.**
- **Apply brake fluid to the master cylinder bore and all of the master cylinder components before reassembly.**

BF **Specification and Classification: DOT 4**

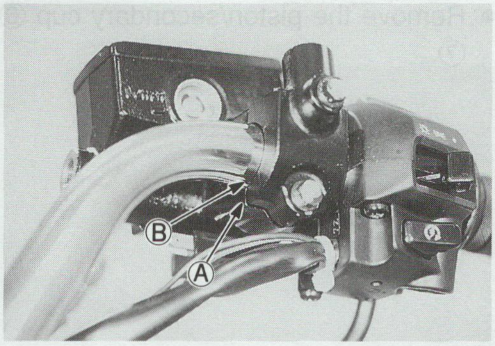
NOTE:
When installing the circlip, make sure that the sharp edge of the circlip faces outside.

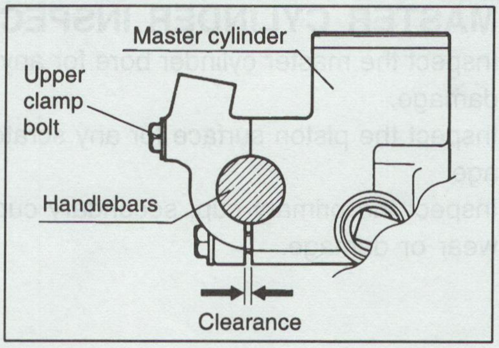
- When reinstalling the brake light switch, align the projection on the switch with the hole in the master cylinder.



- When remounting the master cylinder onto the handlebars, align the master cylinder holder's mating surface Ⓐ with punch mark Ⓑ on the handlebars and tighten the upper clamp bolt first.

Master cylinder bolt: 10 N·m (1.0 kg-m, 7.0 lb-ft)



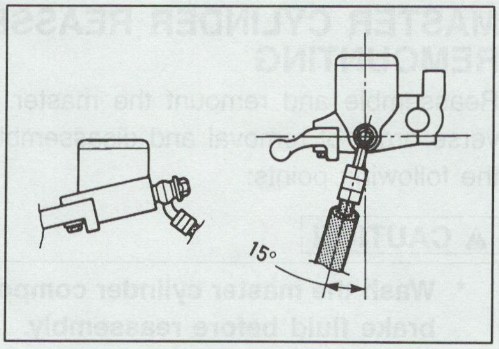

Master cylinder
Upper clamp bolt
Handlebars
Clearance

- Install the brake hose union as shown and tighten the union bolt to the specified torque.

Brake hose union bolt: 23 N·m (2.3 kg-m, 16.5 lb-ft)

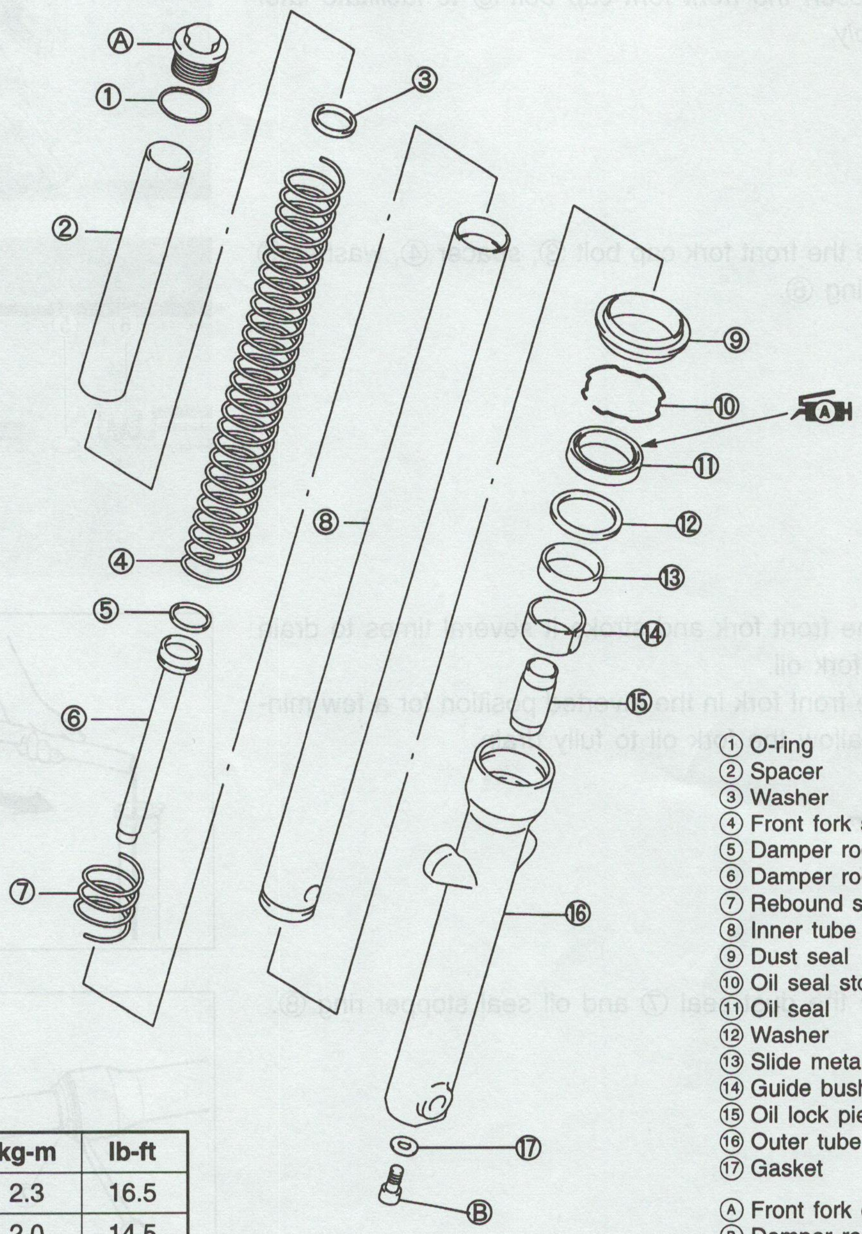
⚠ CAUTION

Bleed air from the brake system after reassembling the master cylinder. (See p. 2-13.)



FRONT FORK

CONSTRUCTION



ITEM	N·m	kg-m	lb-ft
Ⓐ	23	2.3	16.5
Ⓑ	20	2.0	14.5

① O-ring
② Spacer
③ Washer
④ Front fork spring
⑤ Damper rod ring
⑥ Damper rod
⑦ Rebound spring
⑧ Inner tube
⑨ Dust seal
⑩ Oil seal stopper ring
⑪ Oil seal
⑫ Washer
⑬ Slide metal
⑭ Guide bushing
⑮ Oil lock piece
⑯ Outer tube
⑰ Gasket

Ⓐ Front fork cap bolt
Ⓑ Damper rod bolt

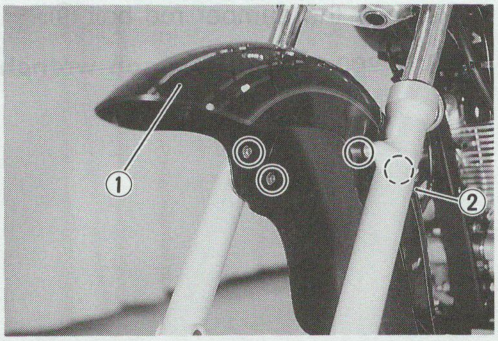
REMOVAL AND DISASSEMBLY

- Remove the front wheel. (See p. 5-4.)
- Remove the brake caliper. (See p. 5-10.)

▲ CAUTION

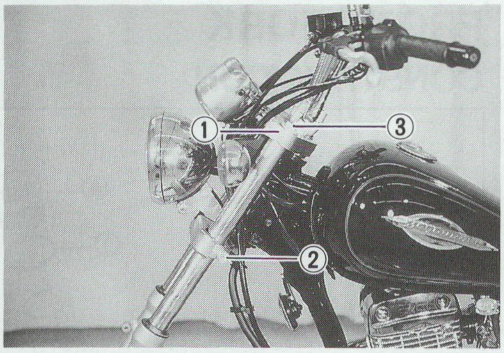
Secure the brake caliper to the frame with a string etc., taking care not to bend the brake hose.

- Remove the speedometer cable guide from the left fork leg.
- Remove the front fender ① and brake hose guide ②.

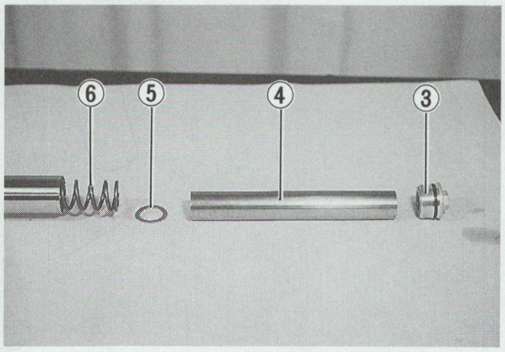


- Remove the front fork after loosening the front fork upper and lower clamp bolts (①, ②).

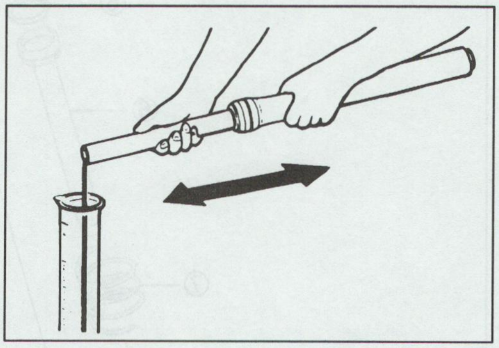
NOTE:
Slightly loosen the front fork cap bolt ③ to facilitate later disassembly.



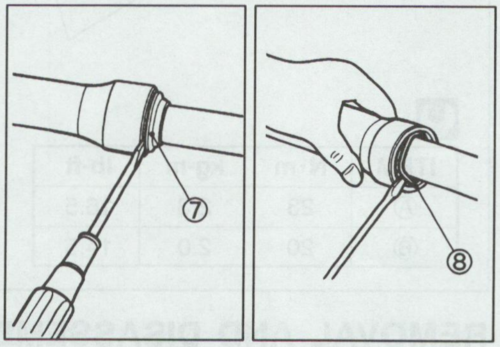
- Remove the front fork cap bolt ③, spacer ④, washer ⑤ and spring ⑥.



- Invert the front fork and stroke it several times to drain out the fork oil.
- Hold the front fork in the inverted position for a few minutes to allow the fork oil to fully drain.

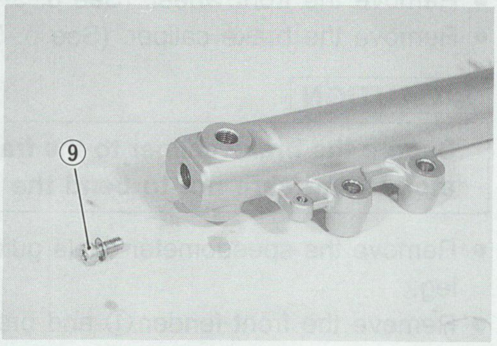


- Remove the dust seal ⑦ and oil seal stopper ring ⑧.

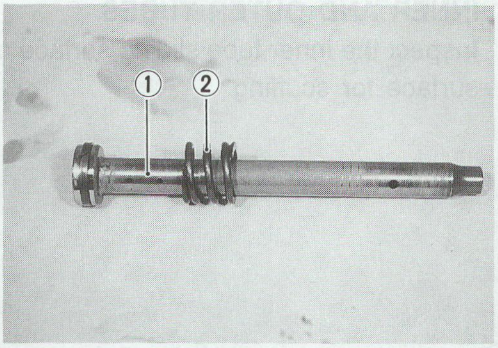


- Remove the damper rod bolt ⑨.

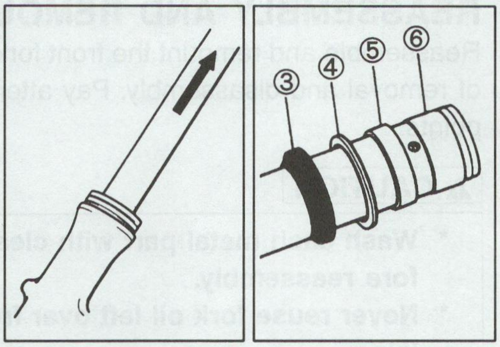
TOOL 09900-00410: Hexagon wrench set



- Remove the damper rod ① and rebound spring ② from the inner tube.



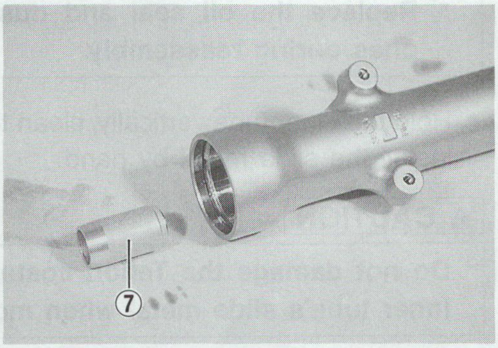
- Separate the inner tube from the outer tube.
- Remove the following parts.
  ③ Oil seal
  ④ Washer
  ⑤ Outer tube slide metal
  ⑥ Inner tube slide metal



▲ CAUTION

The removed oil seal and slide metals should be replaced with new ones.

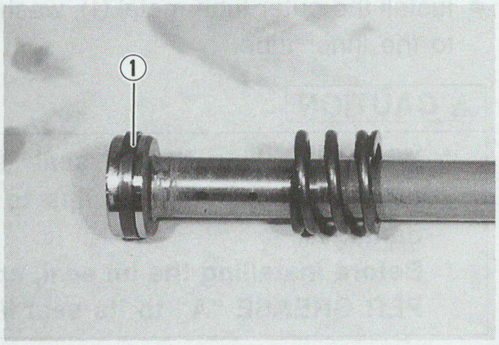
- Remove the oil lock piece ⑦ from the outer tube.



INSPECTION

DAMPER ROD RING

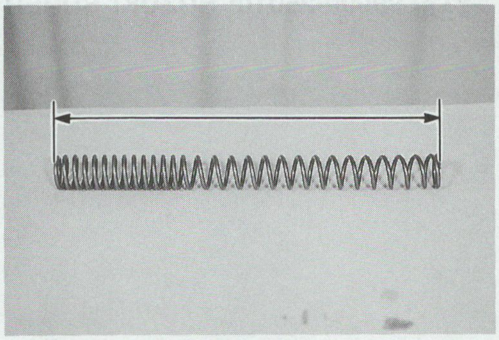
Inspect the damper rod ring ① for wear or damage. If it is worn or damaged, replace it with a new one.



FRONT FORK SPRING

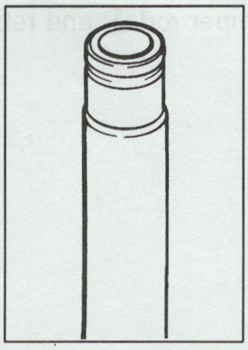
Measure the fork spring free length. If it is shorter than the service limit, replace it with a new one.

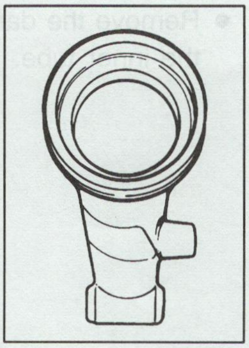
Service Limit: 301 mm (11.9 in)



INNER AND OUTER TUBES

Inspect the inner tube sliding surface and outer tube sliding surface for scuffing.





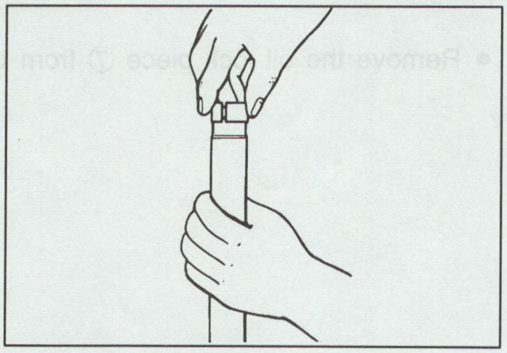
REASSEMBLY AND REMOUNTING

Reassemble and remount the front fork in the reverse order of removal and disassembly. Pay attention to the following points:

▲ CAUTION

- * **Wash each metal part with cleaning solvent before reassembly.**
- * **Never reuse fork oil left over from the last servicing.**
- * **Replace the oil seal and dust seal with new ones during reassembly.**

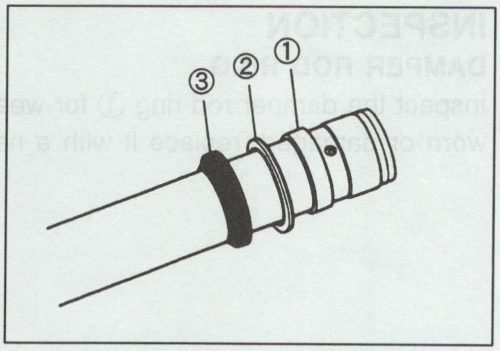
- Hold the inner tube vertically, clean the metal groove and install the slide metal by hand.



▲ CAUTION

Do not damage the Teflon coated surface of the inner tube's slide metal when mounting it.

- Install the outer tube metal ①, washer ② and oil seal ③ to the inner tube.



▲ CAUTION

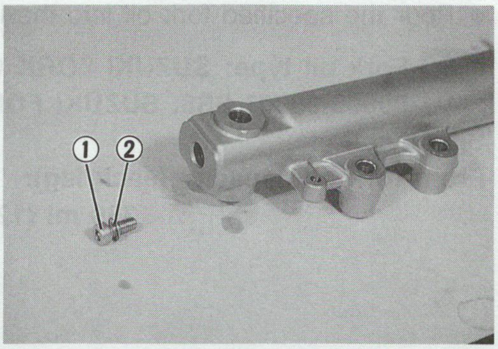
- * **When installing the oil seal ③ onto the inner tube, protect their seal lips to prevent seal lip damage.**
- * **Before installing the oil seal, apply SUZUKI SUPER GREASE "A" to its seal lip lightly.**

99000-25010: SUZUKI SUPER GREASE "A"

- Tighten the damper rod bolt ① to the specified torque.

TOOL **09900-00410: Hexagon wrench set**

Front fork damper rod bolt: 20 N·m (2.0 kg-m, 14.5 lb-ft)



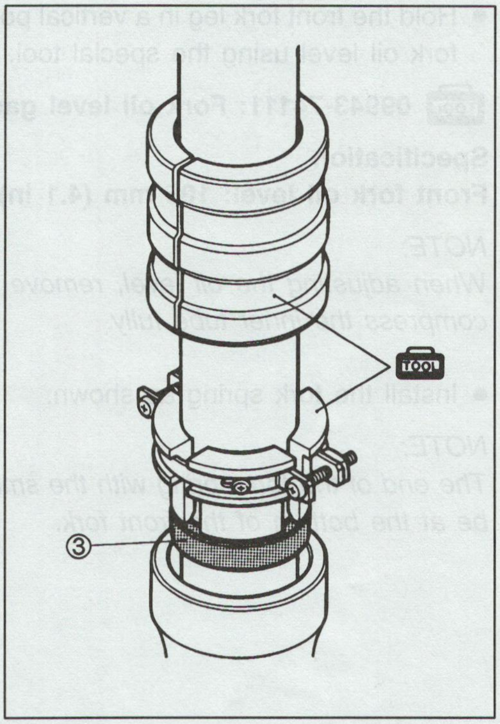
⚠ CAUTION

Use a new damper rod gasket ② to prevent oil leakage.

- Install the oil seal ③ with the special tool.

TOOL **09940-52880: Front fork oil seal installer set**

- Install the oil seal stopper ring ④ and dust seal ⑤.

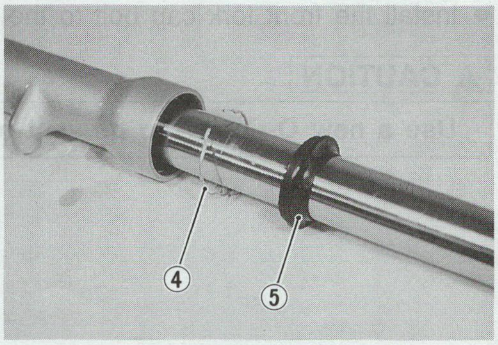


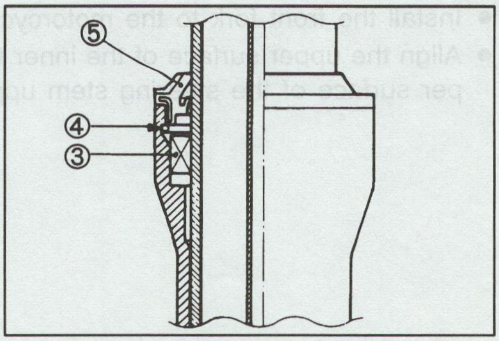
⚠ CAUTION

Make sure that the oil seal stopper ring ④ is fitted securely.

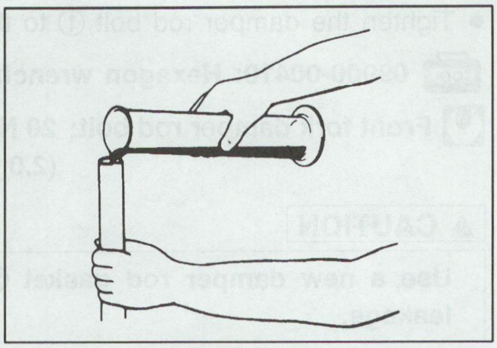
NOTE:
Before installing the dust seal ⑤, apply a small quantity of SUZUKI SUPER GREASE "A" to the lip of dust seal.

A **99000-25010: SUZUKI SUPER GREASE "A"**



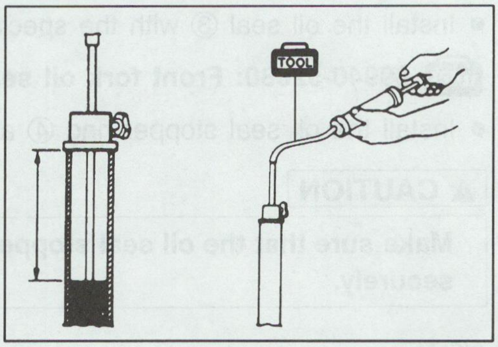


- Pour the specified fork oil into the inner tube.



FORK Fork oil type: SUZUKI FORK OIL SS-08 (#10)
99000-99001-SS8: SUZUKI FORK OIL SS-08
Specification
Front fork oil capacity (each leg):
369 ml (12.5/13.0 US/Imp oz)

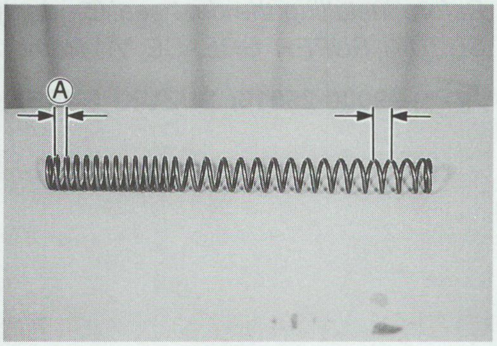
- Hold the front fork leg in a vertical position and adjust the fork oil level using the special tool.



TOOL 09943-74111: Fork oil level gauge
Specification
Front fork oil level: 105 mm (4.1 in)

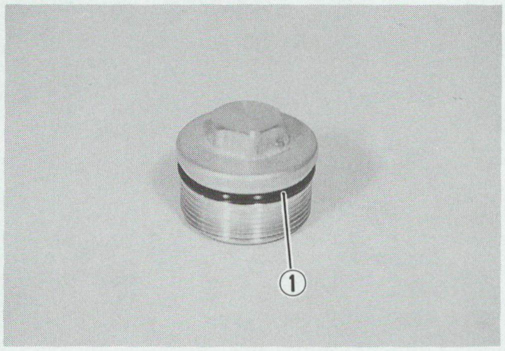
NOTE:
When adjusting the oil level, remove the fork spring and compress the inner tube fully.

- Install the fork spring as shown.



NOTE:
The end of the fork spring with the smaller pitch Ⓐ should be at the bottom of the front fork.

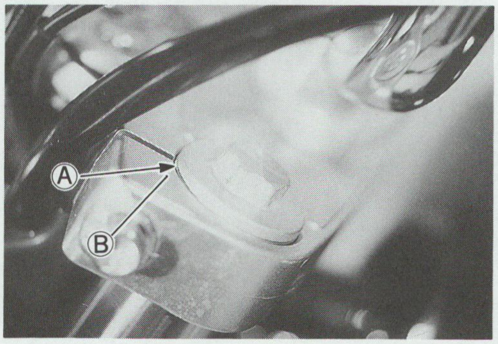
- Install the front fork cap bolt to the inner tube.



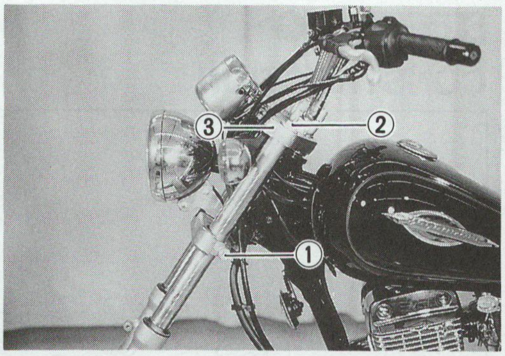
⚠ CAUTION

Use a new O-ring ① to prevent oil leakage.

- Install the front fork to the motorcycle.
- Align the upper surface of the inner tube Ⓐ with the upper surface of the steering stem upper bracket Ⓑ.

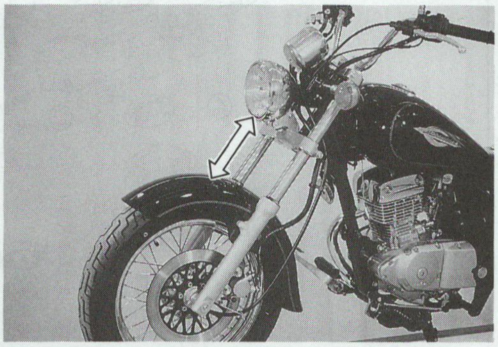


- Tighten the front fork lower clamp bolts ① and front fork cap bolts ② to the specified torque.
- Tighten the front fork upper clamp bolts ③ to the specified torque.



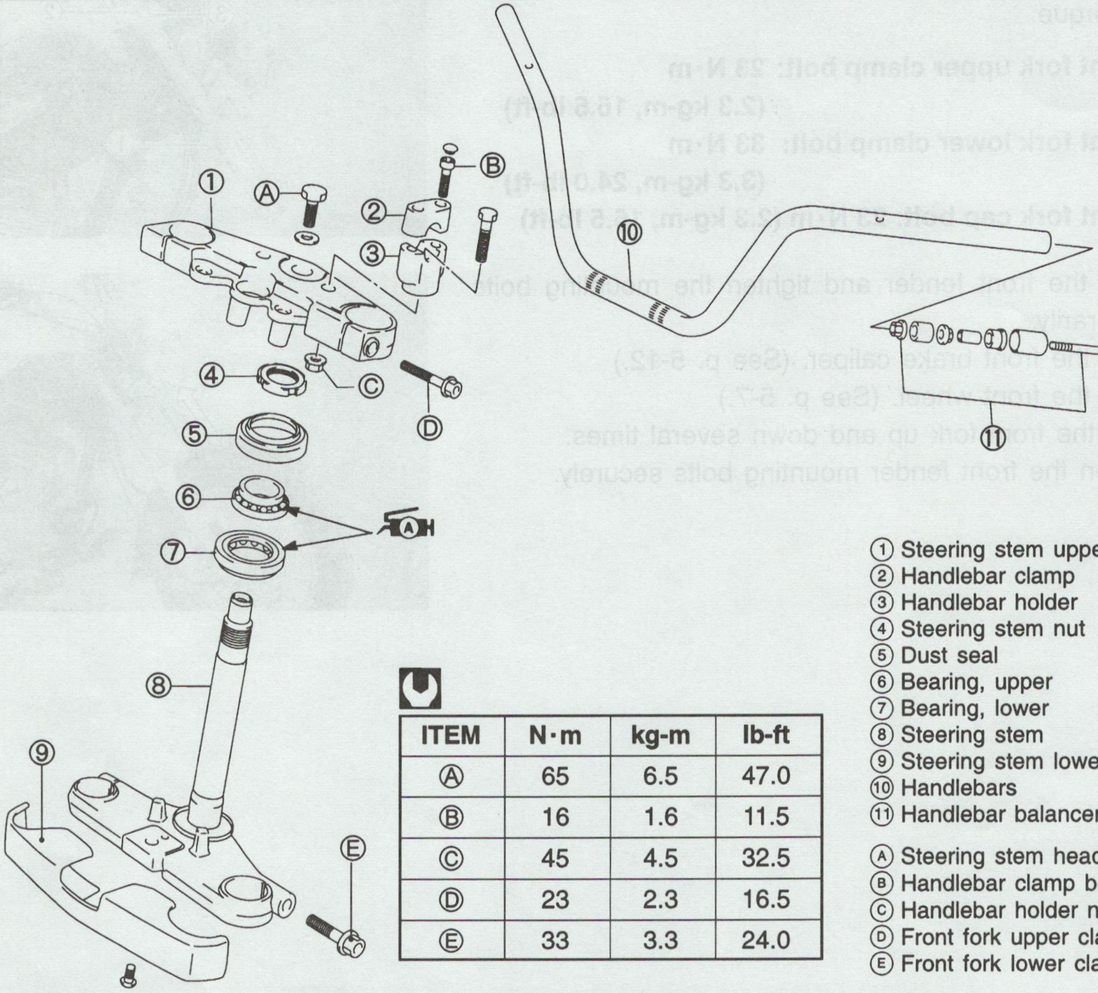
Front fork upper clamp bolt: 23 N·m (2.3 kg-m, 16.5 lb-ft)
Front fork lower clamp bolt: 33 N·m (3.3 kg-m, 24.0 lb-ft)
Front fork cap bolt: 23 N·m (2.3 kg-m, 16.5 lb-ft)

- Install the front fender and tighten the mounting bolts temporarily.
- Install the front brake caliper. (See p. 5-12.)
- Install the front wheel. (See p. 5-7.)
- Move the front fork up and down several times.
- Tighten the front fender mounting bolts securely.



STEERING

CONSTRUCTION



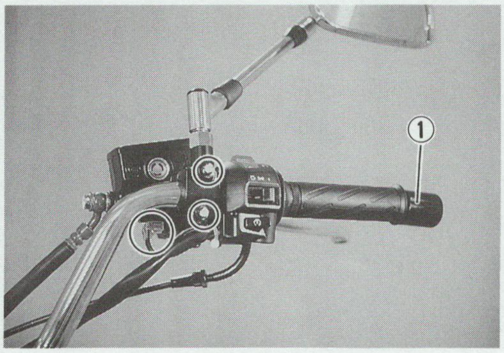
ITEM	N·m	kg-m	lb-ft
Ⓐ	65	6.5	47.0
Ⓑ	16	1.6	11.5
Ⓒ	45	4.5	32.5
Ⓓ	23	2.3	16.5
Ⓔ	33	3.3	24.0

① Steering stem upper bracket
② Handlebar clamp
③ Handlebar holder
④ Steering stem nut
⑤ Dust seal
⑥ Bearing, upper
⑦ Bearing, lower
⑧ Steering stem
⑨ Steering stem lower cover
⑩ Handlebars
⑪ Handlebar balancer

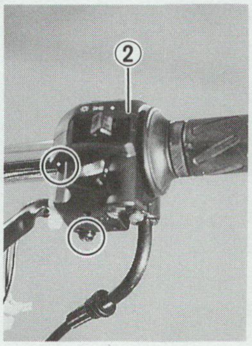
Ⓐ Steering stem head bolt
Ⓑ Handlebar clamp bolt
Ⓒ Handlebar holder nut
Ⓓ Front fork upper clamp bolt
Ⓔ Front fork lower clamp bolt

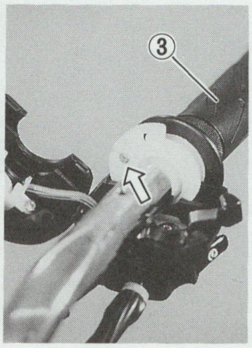
REMOVAL AND DISASSEMBLY

- Remove the front wheel. (See p. 5-4.)
- Remove the front fork. (See p. 5-16.)
- Disconnect the front brake light switch lead wires.
- Remove the front brake master cylinder.
- Remove the right handlebar balancer ①.

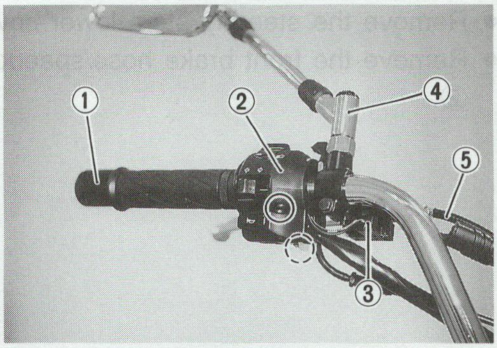


- Remove the handlebar right switch ②.
- Disconnect the throttle cable and remove the throttle grip ③.

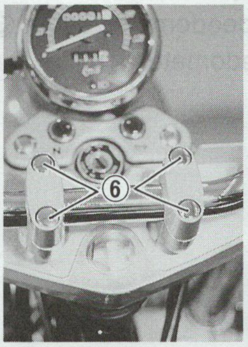


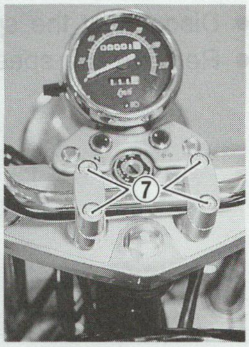


- Remove the left handlebar balancer ①.
- Remove the handlebar left switch ②.
- Disconnect the clutch lever position switch coupler ③.
- Remove the rear view mirror ④.
- Disconnect the clutch cable ⑤.

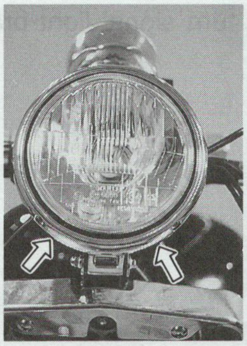


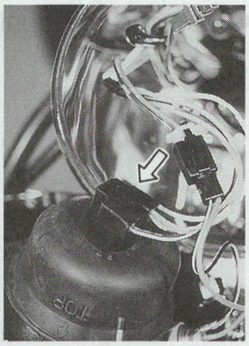
- Remove the handlebar clamp bolt caps ⑥.
- Remove the handlebars by removing the handlebar clamp bolts ⑦.



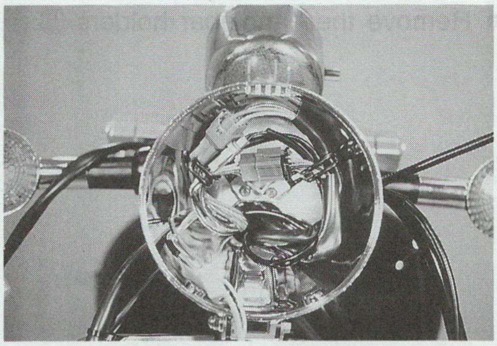


- Remove the headlight.
- Disconnect the headlight coupler.

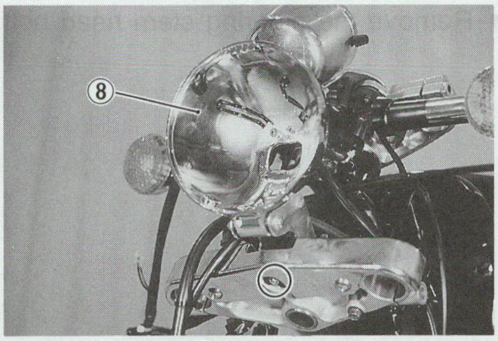




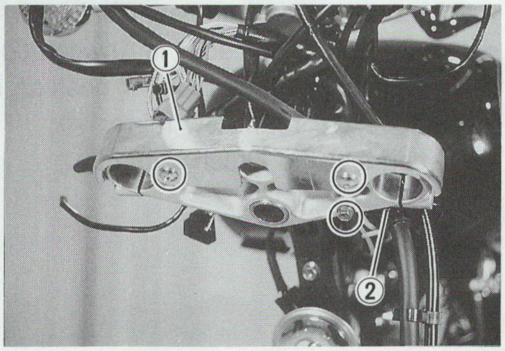
- Disconnect the lead wire couplers.



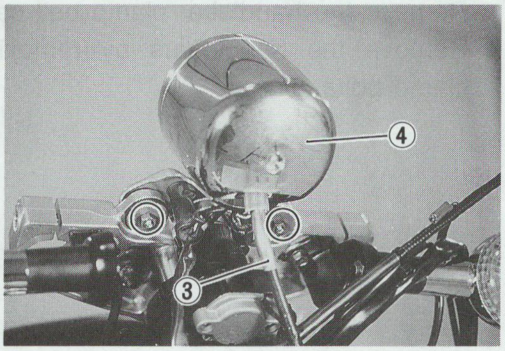
- Remove the headlight housing ⑧ by removing the mounting nut.



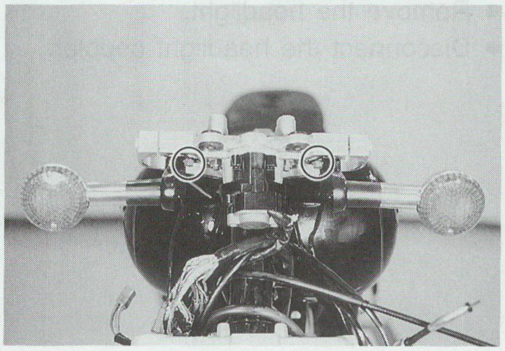
- Remove the steering stem lower cover ①.
- Remove the front brake hose/speedometer cable guide ②.



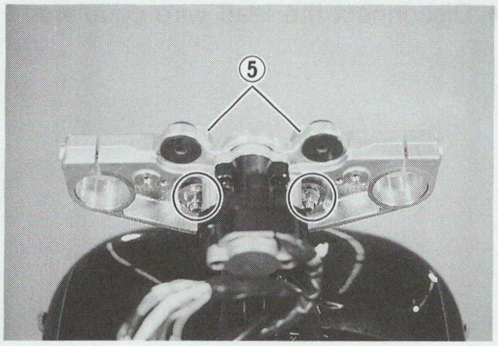
- Disconnect the speedometer cable ③.
- Remove the speedometer ④.



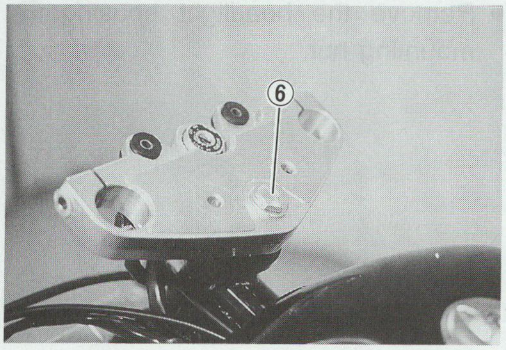
- Remove the front turn signal light brackets.



- Remove the handlebar holders ⑤.



- Remove the steering stem head bolt ⑥.

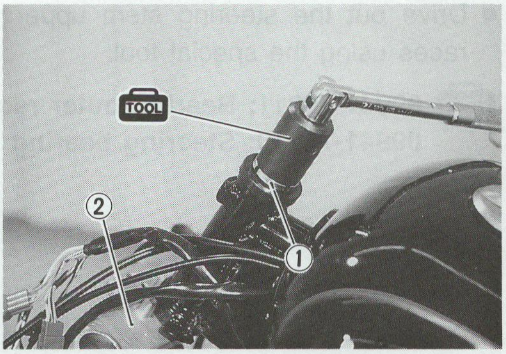


- Remove the steering stem nut ① using the special tool.

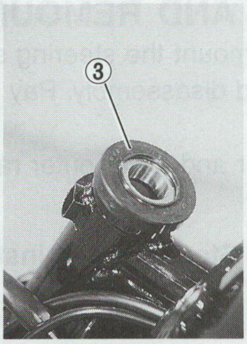
TOOL 09940-14911: Steering stem nut wrench

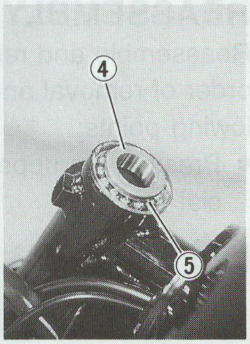
- Draw out the steering stem lower bracket ②.

NOTE:
Hold the steering stem lower bracket to prevent it from falling.



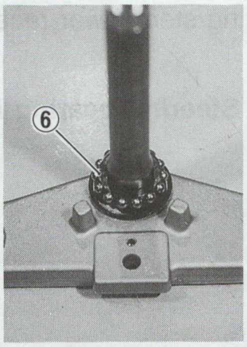
- Remove the dust seal ③, upper bearing inner race ④ and upper bearing ⑤.

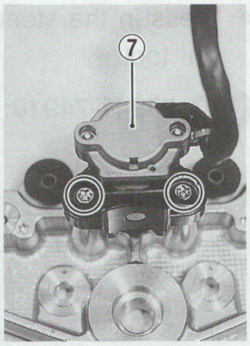




- Remove the lower bearing ⑥.
- Remove the ignition switch ⑦ using the special tool.

TOOL 09930-11920: Torx bit JT40H
09930-11940: Bit holder



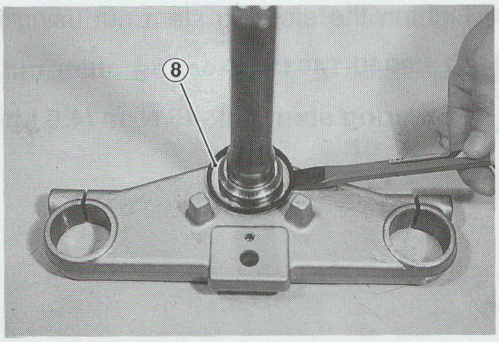


INSPECTION

Inspect the removed parts for the following abnormalities.

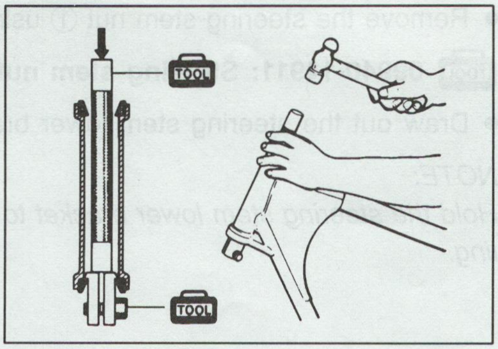
* Handlebar distortion
* Handlebar clamp wear
* Race wear and brinelling
* Bearing wear or damage
* Abnormal bearing noise
* Distortion of the steering stem

- Remove the lower bearing outer race ⑧ using a chisel.



- Drive out the steering stem upper and lower bearing races using the special tool.

TOOL **09941-54911: Bearing outer race remover**
09941-74910: Steering bearing installer

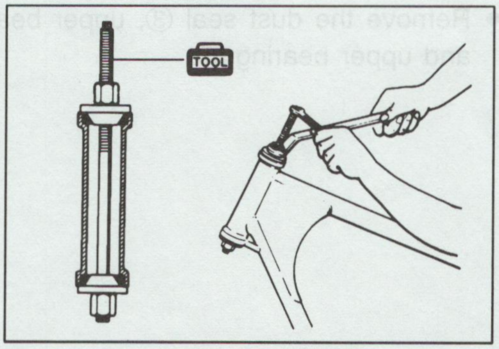


REASSEMBLY AND REMOUNTING

Reassemble and remount the steering stem in the reverse order of removal and disassembly. Pay attention to the following points:

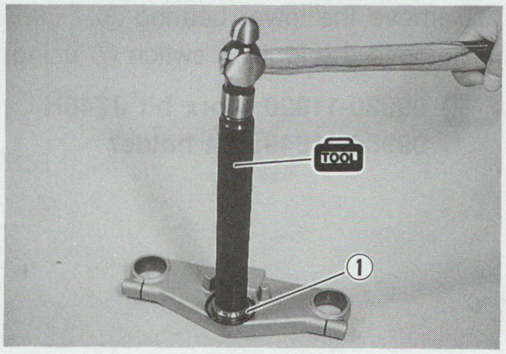
- Press in the upper and lower outer races using the special tool.

TOOL **09941-34513: Steering race installer**



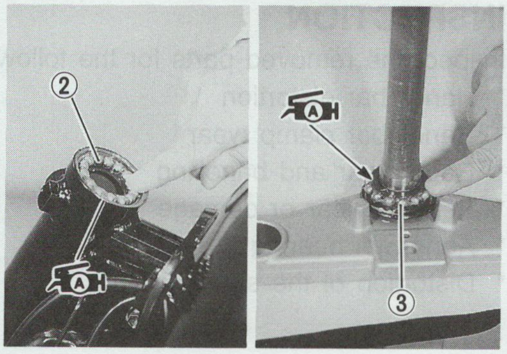
- Press in the steering stem lower race ① using the special tool.

TOOL **09941-74910: Steering bearing installer**



- Apply grease to the upper ② and lower ③ bearings.

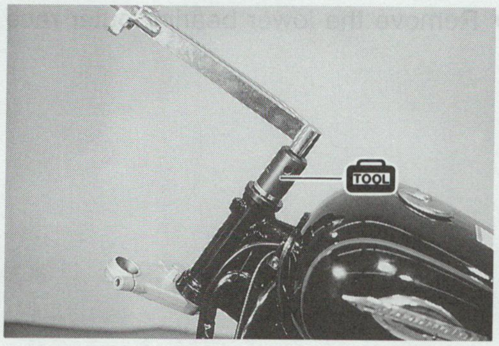
A H **99000-25010: SUZUKI SUPER GREASE "A"**



- Tighten the steering stem nut using the special tool.

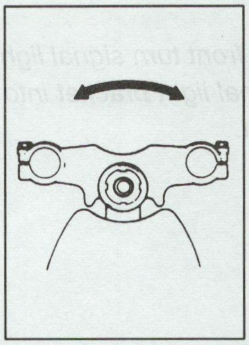
TOOL **09940-14911: Steering stem nut wrench**

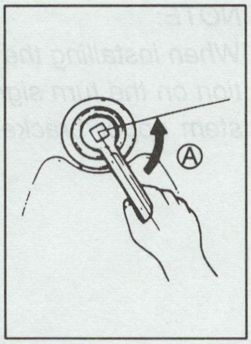
Steering stem nut: 45 N·m (4.5 kg-m, 32.5 lb-ft)



- Turn the steering stem lower bracket about five or six times to the left and right.
- Loosen the steering stem nut ¼–½ of a turn Ⓐ.

NOTE:
This adjustment will vary from motorcycle to motorcycle. Make sure that the steering turns smoothly and easily in both directions.

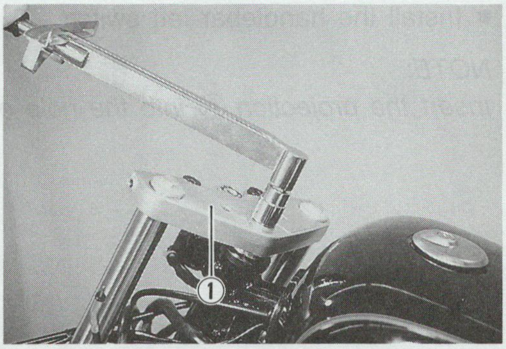




- Install the steering stem upper bracket ①.
- Install the right and left front forks.
- Tighten the front fork lower clamp bolts.
- Tighten the steering stem head bolt to the specified torque.

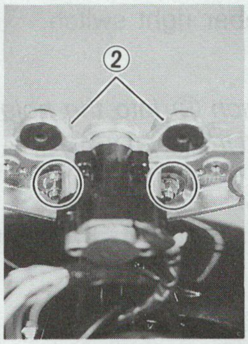
Steering stem head bolt: 65 N·m (6.5 kg-m, 47.0 lb-ft)

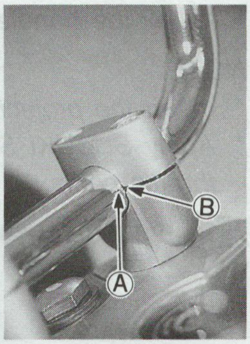
- Align the upper surface of the front fork inner tube with the upper surface of the steering stem upper bracket.
- Tighten the upper and lower front fork clamp bolts to the specified torque.



Front fork clamp bolt
upper: 23 N·m (2.3 kg-m, 16.5 lb-ft)
lower: 33 N·m (3.3 kg-m, 24.0 lb-ft)

- Install the handlebar holders ② and tighten their nuts temporarily.
- Install the handlebars with the punch mark Ⓐ aligned with the handlebar clamp Ⓑ as shown.

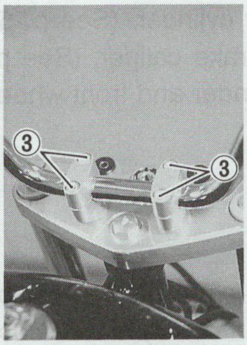


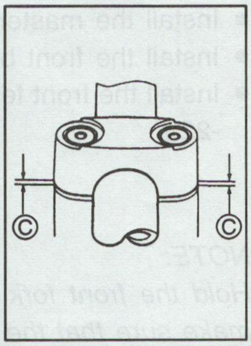


- Tighten the handlebar clamp bolts ③ to the specified torque.

Handlebar clamp bolt: 16 N·m (1.6 kg-m, 11.5 lb-ft)

NOTE:
The gap Ⓒ between the handlebar clamp and holder should be even.

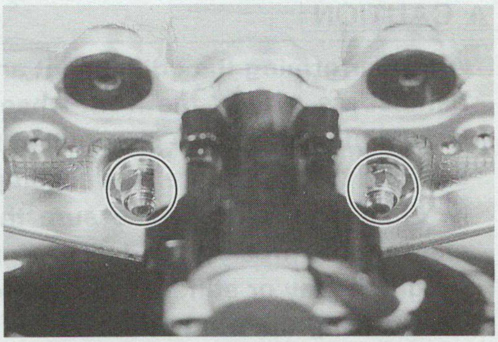




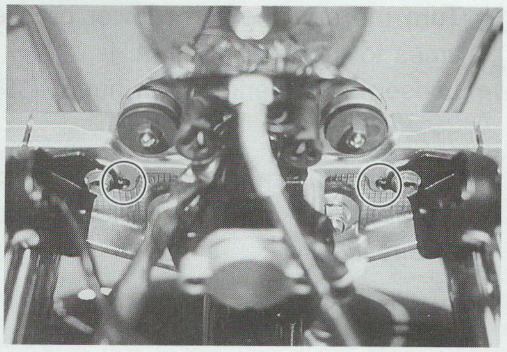
- Tighten the handlebar holder nuts to the specified torque.

Handlebar holder nut: 45 N·m (4.5 kg-m, 32.5 lb-ft)

- Install the handlebar clamp bolt caps.

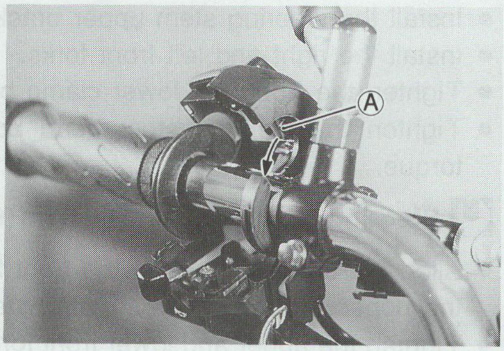


NOTE:
When installing the front turn signal lights, insert the projection on the turn signal light bracket into the hole of steering stem upper bracket.



- Install the handlebar left switch.

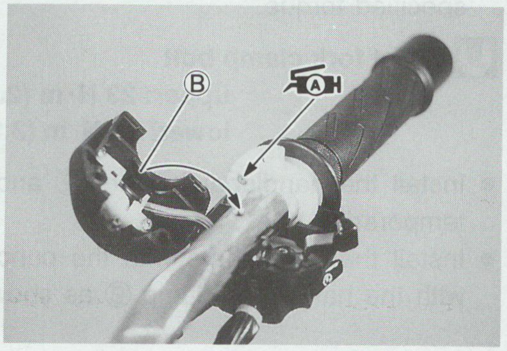
NOTE:
Insert the projection Ⓐ into the hole of the handlebars.



- Install the handlebar right switch.

NOTE:
** Insert the projection Ⓑ into the hole of the handlebars.*
** Apply SUZUKI SUPER GREASE “A” to the end of the throttle cable.*

ⒶH 99000-25010: SUZUKI SUPER GREASE “A”

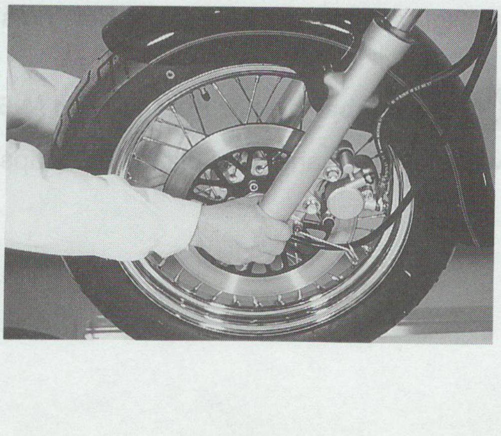


- Install the master cylinder. (See p. 5-15.)
- Install the front brake caliper. (See p. 5-11.)
- Install the front fender and front wheel. (See pp. 5-7 and -22.)

NOTE:
Hold the front fork legs, move them back and forth and make sure that the steering is not loose.

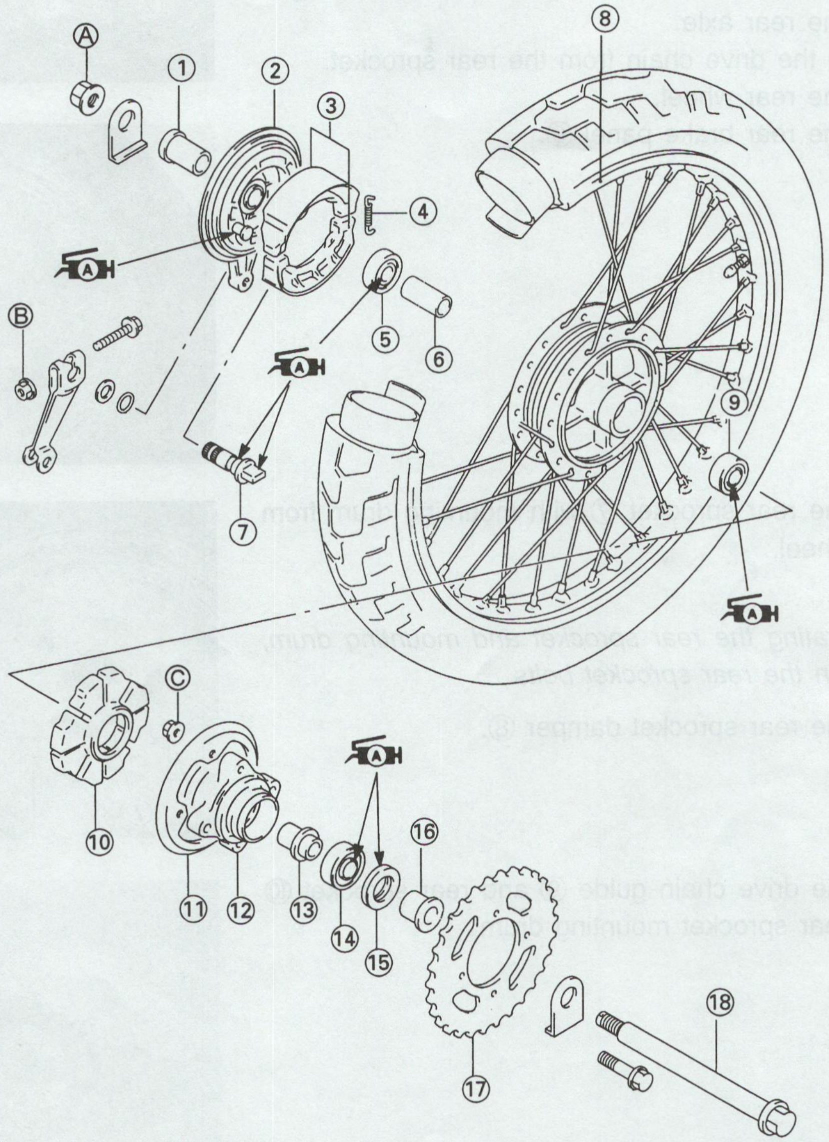
▲ CAUTION

After performing the adjustment and installing the handlebars, “rock” the front wheel assembly forward and backward to ensure that there is no play and that the procedure was accomplished correctly. Finally, check to make sure that the steering stem moves freely from left to right with its own weight. If play or stiffness is noticeable, re-adjust the steering stem nut.



REAR WHEEL AND REAR BRAKE

CONSTRUCTION

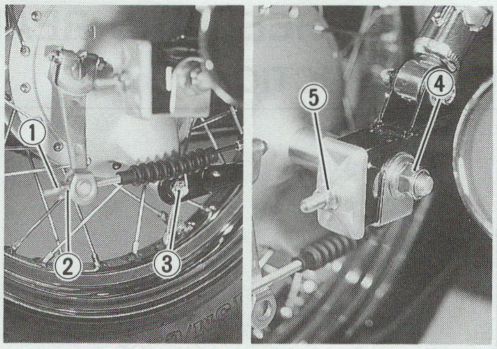


① Spacer
② Brake panel
③ Brake shoe
④ Spring
⑤ Bearing
⑥ Spacer
⑦ Brake camshaft
⑧ Rear wheel
⑨ Bearing
⑩ Damper
⑪ Drive chain guide
⑫ Rear sprocket mounting drum
⑬ Retainer
⑭ Bearing
⑮ Dust seal
⑯ Spacer
⑰ Rear sprocket
⑱ Rear axle

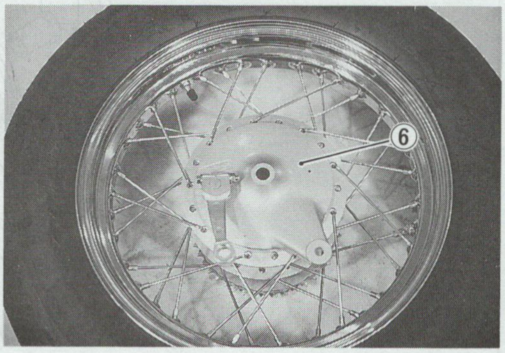
Ⓐ Rear axle nut
Ⓑ Rear brake cam lever nut
Ⓒ Rear sprocket mounting nut

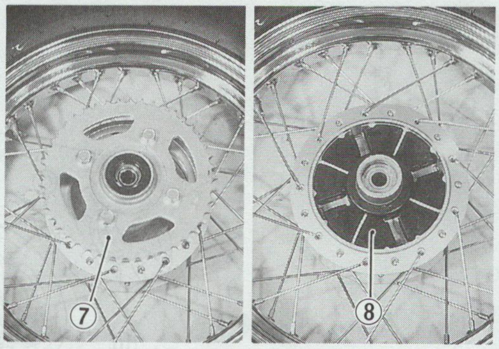
ITEM	N·m	kg-m	kg-m
Ⓐ	78	7.8	56.5
Ⓑ	10	1.0	7.0
Ⓒ	50	5.0	36.0

REMOVAL



- Remove the clip ① and rear brake adjusting nut ②.
- Remove the cotter pin, torque link nut ③ and bolt.
- Remove the rear axle nut ④.
- Raise the rear wheel off the ground with a jack or wooden block.
- Loosen the drive chain adjusting nuts ⑤, left and right.
- Remove the rear axle.
- Disengage the drive chain from the rear sprocket.
- Remove the rear wheel.
- Remove the rear brake panel ⑥.

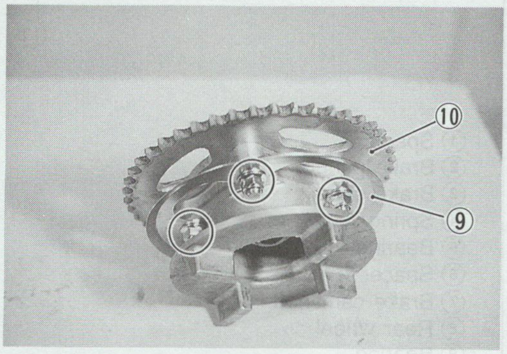




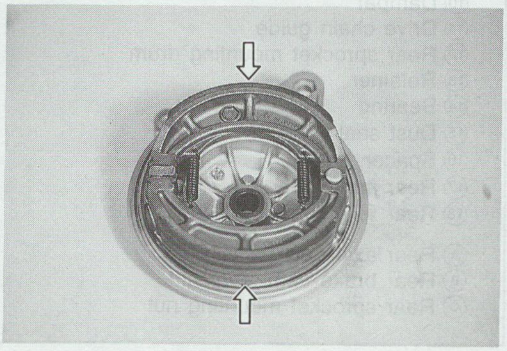
- Remove the rear sprocket ⑦ with mounting drum from the rear wheel.

NOTE:
Before separating the rear sprocket and mounting drum, slightly loosen the rear sprocket bolts.

- Remove the rear sprocket damper ⑧.

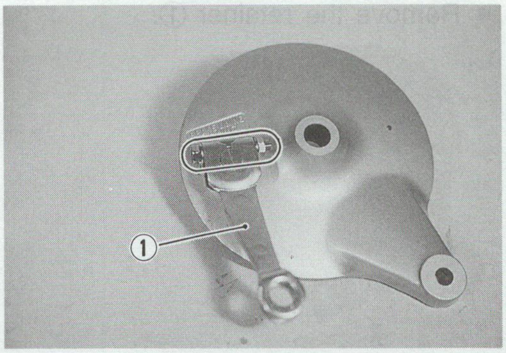


- Remove the drive chain guide ⑨ and rear sprocket ⑩ from the rear sprocket mounting drum.

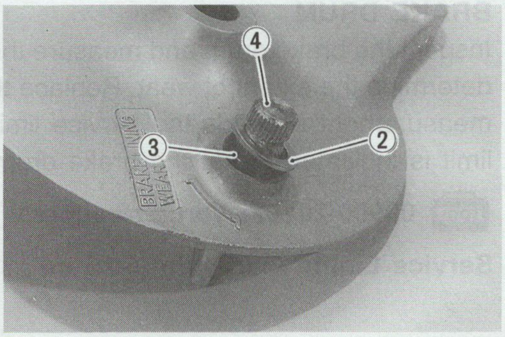


- Remove the brake shoes from the brake panel.

- Remove the brake cam lever bolt and nut.
- Remove the brake cam lever ①.



- Remove the washer ②, O-ring ③ and brake camshaft ④.



INSPECTION AND DISASSEMBLY

WHEEL BEARING	See pp. 5-4 and -5.
WHEEL AXLE	See p. 5-5.
WHEEL	See p. 5-5.
SPOKE NIPPLE	See p. 5-5.
REAR SPROCKET MOUNTING DRUM BEARING	See p. 5-4.

* **Inspect of the rear sprocket mounting drum bearing in the same manner as the wheel bearing.**

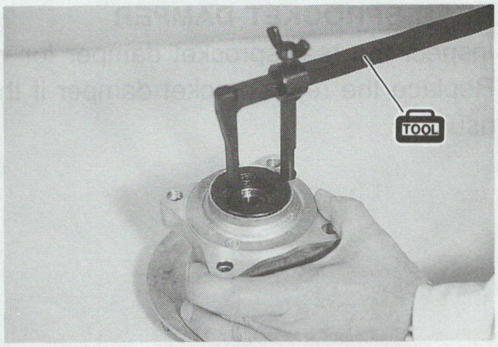
Remove the rear sprocket mounting drum bearing as follows.

- Remove the dust seal using the special tool.

TOOL 09913-50121: Oil seal remover

⚠ CAUTION

The removed dust seal should be replaced with a new one.

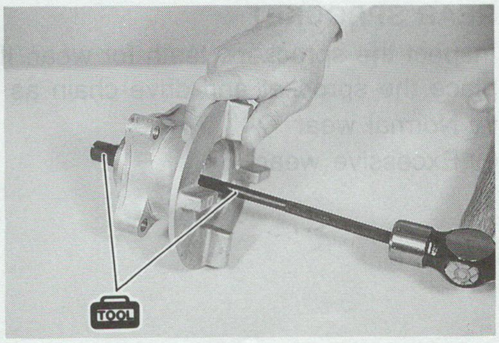


- Remove the rear sprocket mounting drum bearing using the special tool.

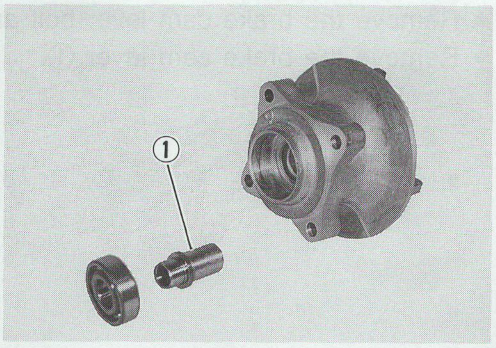
TOOL 09941-50111: Bearing remover

⚠ CAUTION

The removed bearing should be replaced with a new one.



- Remove the retainer ①.

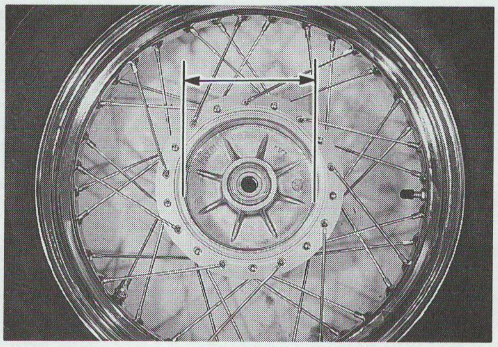


BRAKE DRUM

Inspect the brake drum and measure the brake drum I.D. to determine the extent of wear. Replace the brake drum if the measurement exceeds the service limit. The value of this limit is indicated inside the brake drum.

TOOL 09900-20102: Vernier calipers

Service Limit: 130.7 mm (5.15 in)



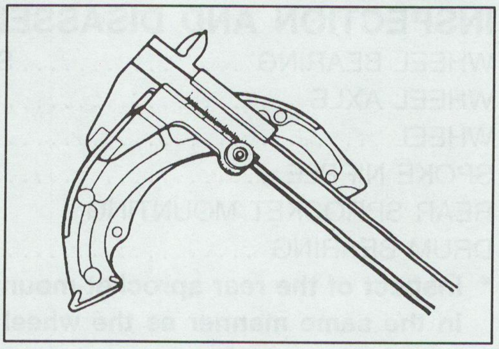
BRAKE SHOES

Check the brake shoes and decide whether it should be replaced or not from the thickness of the brake shoe lining.

Service Limit: 1.5 mm (0.06 in)

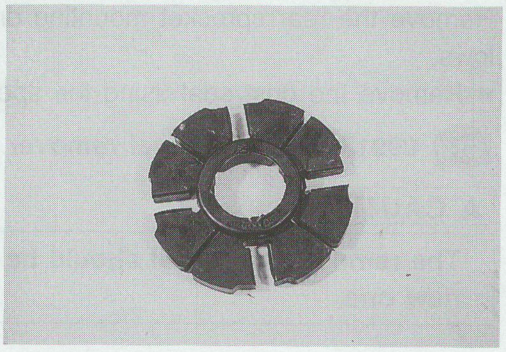
▲ CAUTION

Replace the brake shoes as a set, otherwise braking performance will be adversely affected.



REAR SPROCKET DAMPER

Inspect the rear sprocket damper for wear and damage. Replace the rear sprocket damper if there is anything unusual.

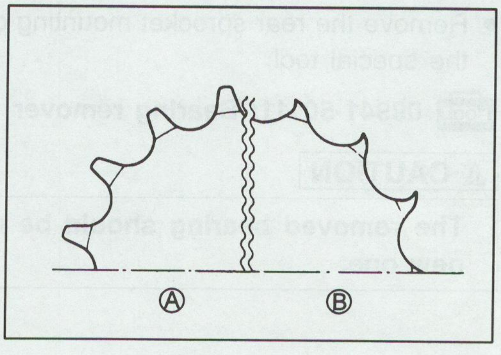


REAR SPROCKET

Inspect the sprocket's teeth for wear. If they are worn, replace the sprocket and drive chain as a set.

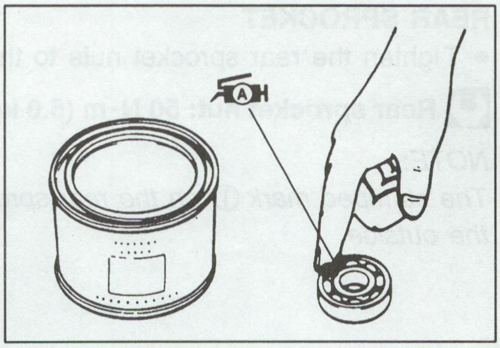
Ⓐ Normal wear

Ⓑ Excessive wear



REASSEMBLY AND REMOUNTING

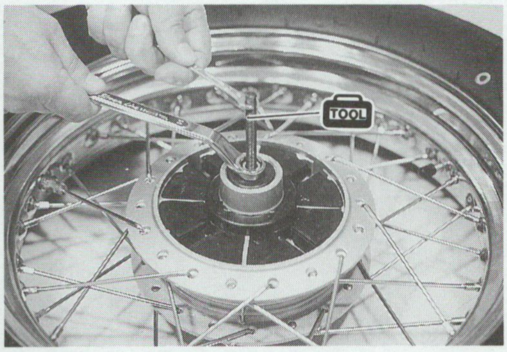
Reassemble and remount the rear wheel and rear brake in the reverse order of removal and disassembly. Pay attention to the following points:



WHEEL BEARING

- Apply SUZUKI SUPER GREASE "A" to the bearing before installation.

99000-25010: SUZUKI SUPER GREASE "A"

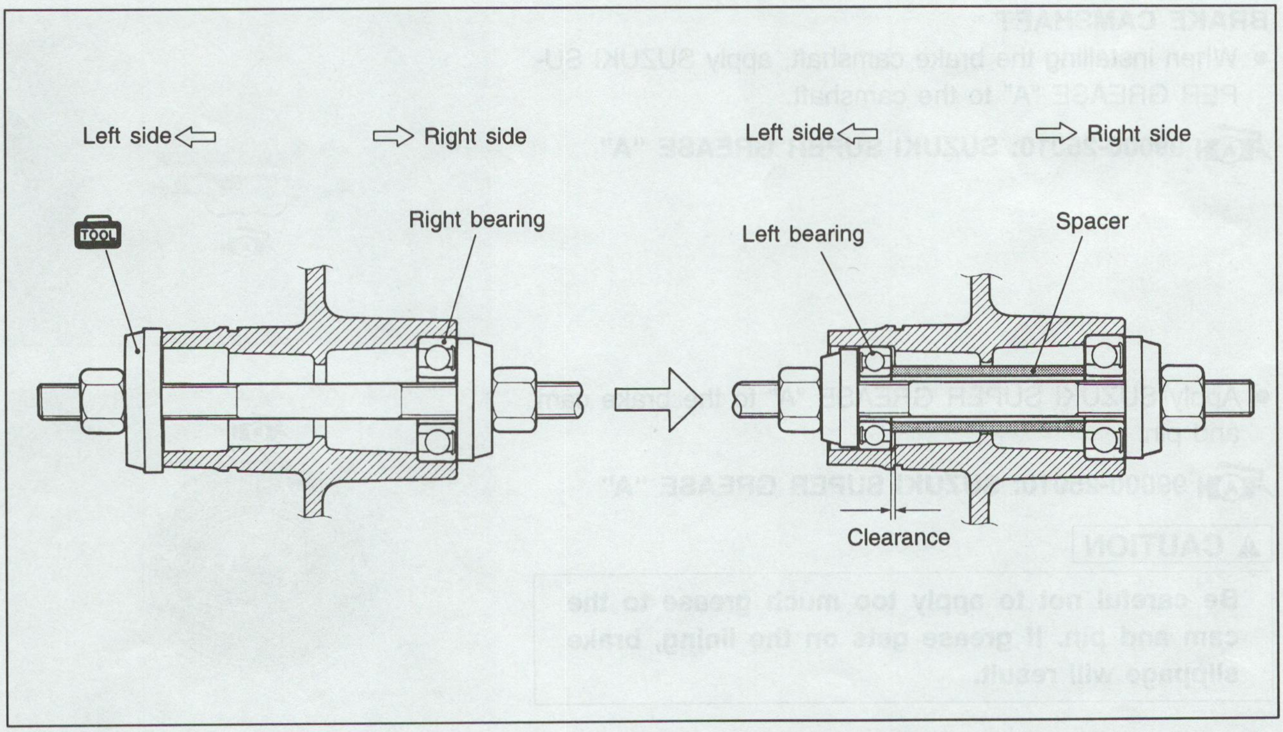


- Press fit the bearing to the wheel using the special tools.

TOOL **09924-84510: Bearing installer set**
09924-84521: Bearing installer set

▲ CAUTION

> * **First install the right wheel bearing, then left wheel bearing.**
> * **The sealed cover on the bearing must face out.**


Left side
Right side
TOOL
Right bearing
Left side
Right side
Left bearing
Spacer
Clearance

REAR SPROCKET MOUNTING DRUM BEARING

- Install the rear sprocket mounting drum bearing and dust seal using the special tool.

TOOL **09913-76010: Bearing installer**

NOTE:
Apply grease to the bearing and dust seal lip before assembling the rear sprocket mounting drum.

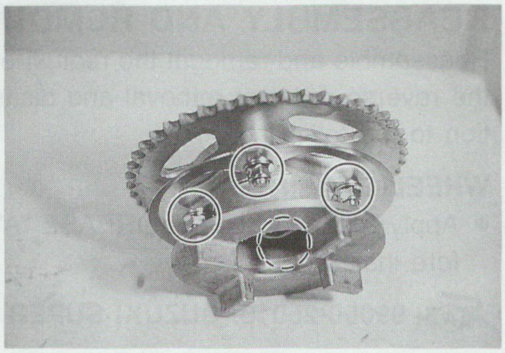
99000-25010: SUZUKI SUPER GREASE "A"

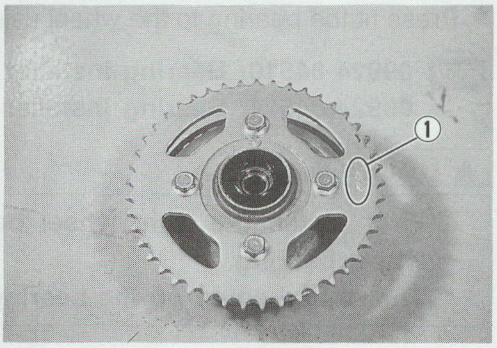
REAR SPROCKET

- Tighten the rear sprocket nuts to the specified torque.

Rear sprocket nut: 50 N·m (5.0 kg-m, 36.0 lb-ft)

NOTE:
The stamped mark ① on the rear sprocket should face to the outside.

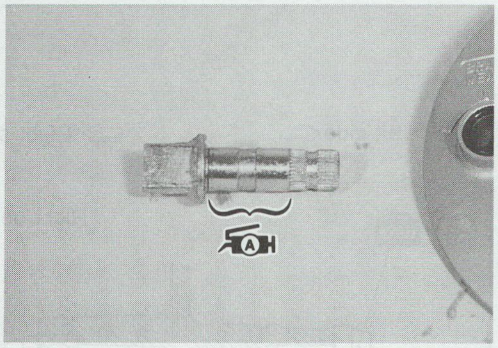




BRAKE CAMSHAFT

- When installing the brake camshaft, apply SUZUKI SUPER GREASE “A” to the camshaft.

99000-25010: SUZUKI SUPER GREASE “A”

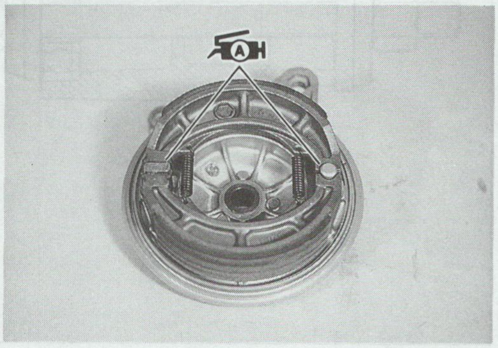


- Apply SUZUKI SUPER GREASE “A” to the brake cam and pin.

99000-25010: SUZUKI SUPER GREASE “A”

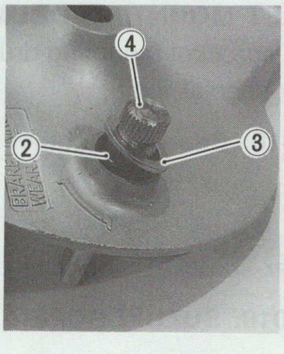
▲ CAUTION

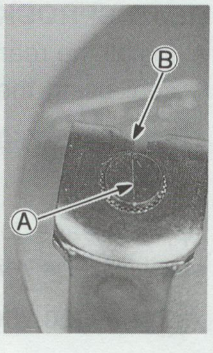
Be careful not to apply too much grease to the cam and pin. If grease gets on the lining, brake slippage will result.



BRAKE CAM LEVER

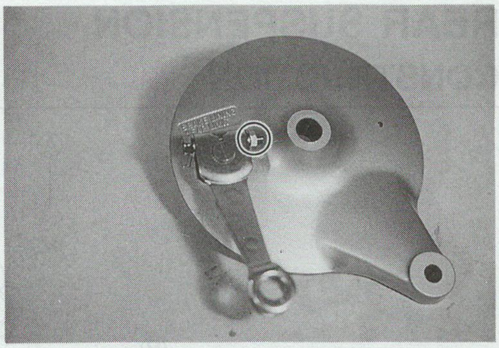
- Install the new O-ring ② and washer ③.
- Align the notch Ⓐ on the brake camshaft with the slit Ⓑ in the brake cam lever as shown.





- Tighten the brake cam lever nut to the specified torque.

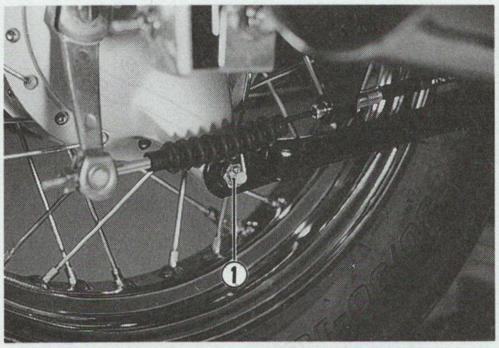
Brake cam lever nut: 10 N·m (1.0 kg-m, 7.0 lb-ft)



REAR WHEEL

- Tighten the rear torque link nut ① to the specified torque and install the new cotter pin.

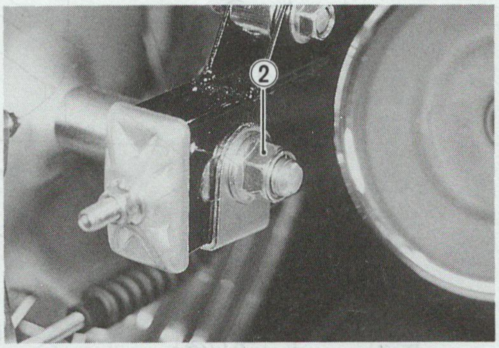
Rear torque link nut: 13 N·m (1.3 kg-m, 9.5 lb-ft)



- Adjust the drive chain slack after installing the rear wheel. (See p. 2-11.)
- Tighten the rear axle nut ② to the specified torque.

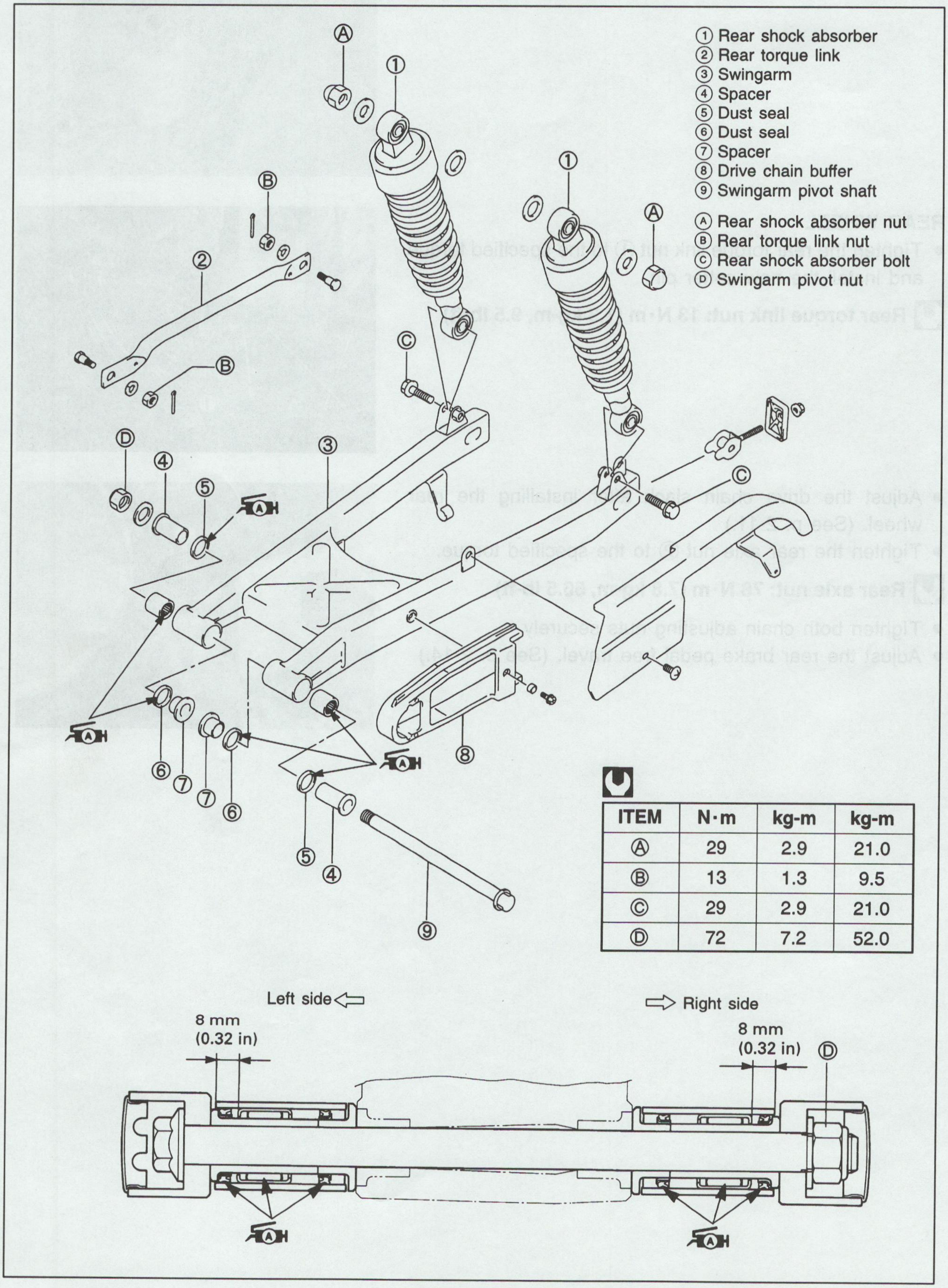
Rear axle nut: 78 N·m (7.8 kg-m, 56.5 lb-ft)

- Tighten both chain adjusting nuts securely.
- Adjust the rear brake pedal free travel. (See p. 2-14.)



REAR SUSPENSION

CONSTRUCTION


Ⓐ
①
①
Ⓐ
Ⓑ
②
Ⓑ
Ⓒ
Ⓒ
Ⓓ
④
⑤
③
Ⓐ
⑥
⑦
⑦
⑥
⑤
④
⑧
⑨
Left side
Right side
8 mm
(0.32 in)
8 mm
(0.32 in)
Ⓓ
Ⓐ
Ⓐ

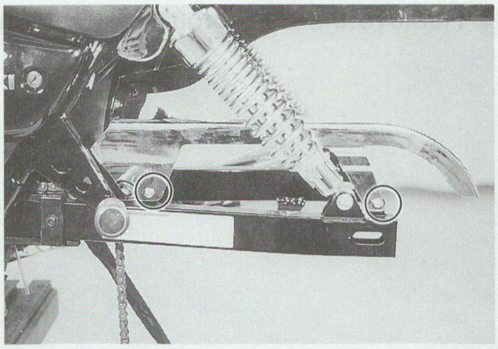
① Rear shock absorber
② Rear torque link
③ Swingarm
④ Spacer
⑤ Dust seal
⑥ Dust seal
⑦ Spacer
⑧ Drive chain buffer
⑨ Swingarm pivot shaft

Ⓐ Rear shock absorber nut
Ⓑ Rear torque link nut
Ⓒ Rear shock absorber bolt
Ⓓ Swingarm pivot nut

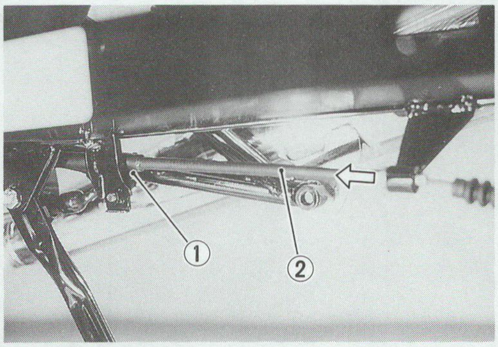
ITEM	N·m	kg-m	kg-m
Ⓐ	29	2.9	21.0
Ⓑ	13	1.3	9.5
Ⓒ	29	2.9	21.0
Ⓓ	72	7.2	52.0

REMOVAL

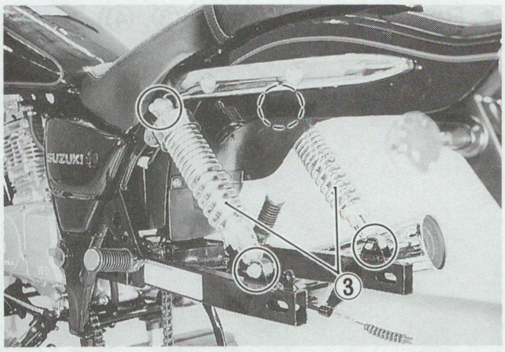
- Remove the rear wheel. (See p. 5-31.)
- Remove the drive chain case.



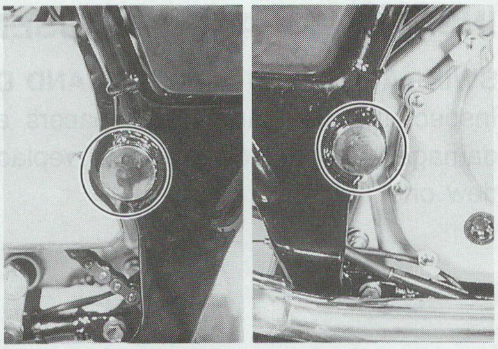
- Remove the rear brake cable holder ①.
- Remove the rear brake cable ② from the swingarm.



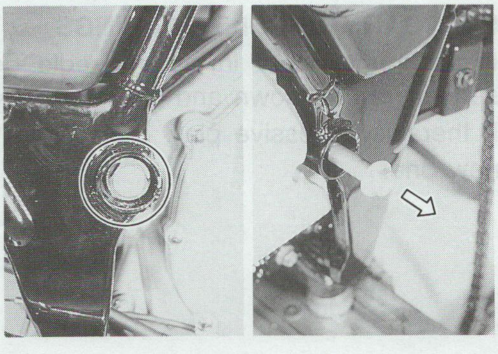
- Remove the shock absorbers ③.



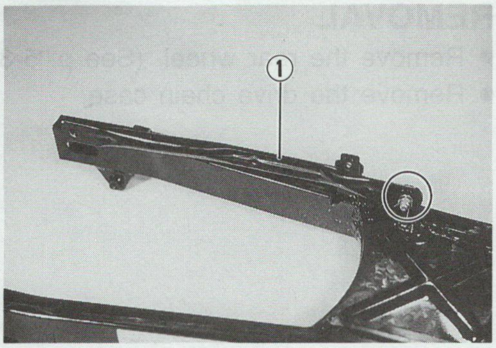
- Remove the left and right pivot shaft end caps.



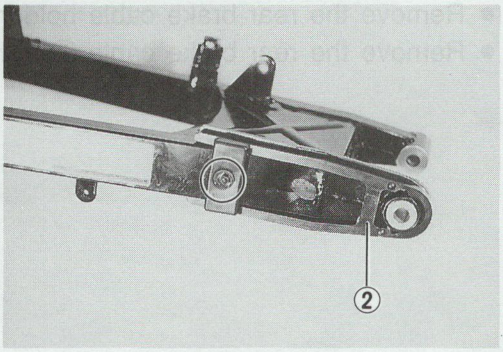
- Remove the swingarm pivot nut and washer.
- Remove the swingarm by removing the pivot shaft.



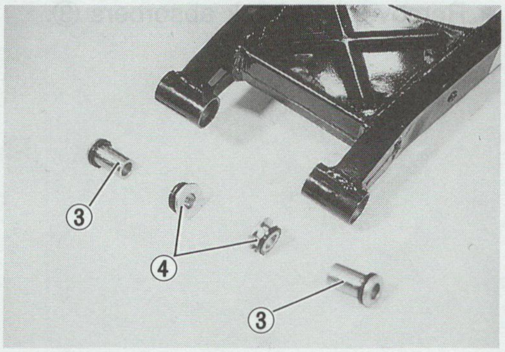
- Remove the rear torque link ① from the swingarm.



- Remove the chain buffer ② from the swingarm.



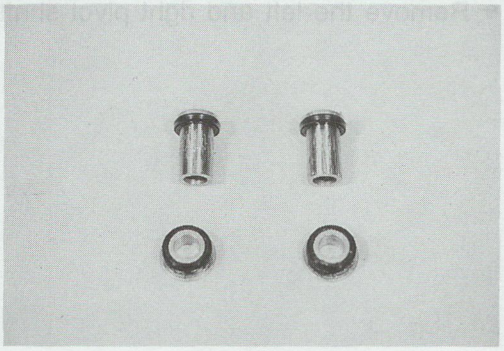
- Remove the spacers (③, ④).



INSPECTION AND DISASSEMBLY

SWINGARM PIVOT SPACERS AND DUST SEALS

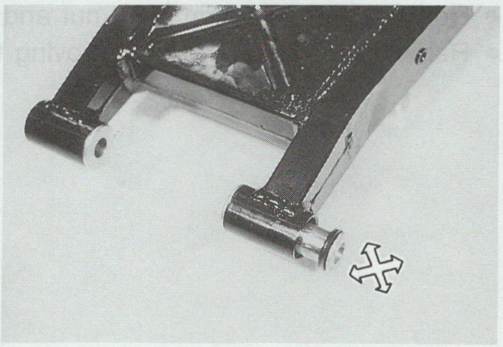
Inspect the swingarm pivot spacers and dust seals for damage. If any defects are found, replace the spacer with a new one.



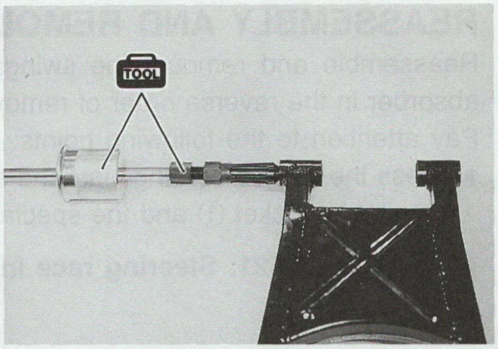
SWINGARM NEEDLE BEARINGS

Insert the spacers into the needle bearings, move the spacer up and down and check for any play.

If there is excessive play, replace the bearing(-s) with a new one.



- Remove the swingarm needle bearings using the special tools.



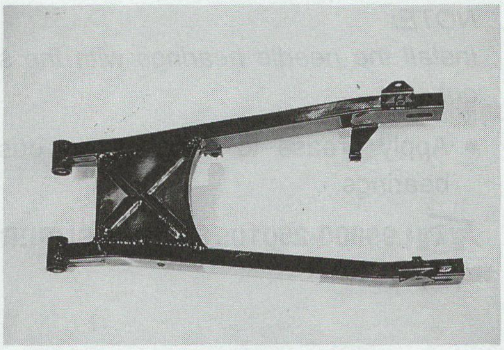
TOOL **09923-74510: Bearing remover**
09930-30102: Sliding shaft

▲ CAUTION

The removed needle bearings should be replaced with new ones.

SWINGARM

Inspect the swingarm for damage.
If any defects are found, replace the swingarm with a new one.

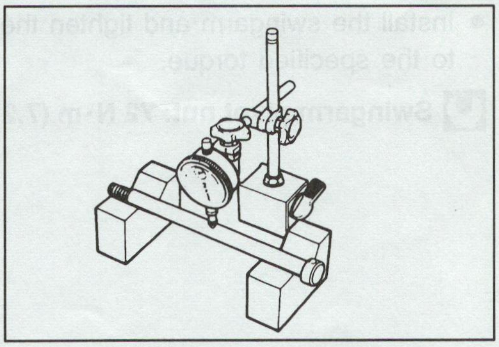


CHAIN BUFFER

Inspect the chain buffer for wear and damage. If any defects are found, replace the chain buffer with a new one.

SWINGARM PIVOT SHAFT

Measure the pivot shaft runout using the dial gauge. If the pivot shaft exceeds the service limit, replace it with a new one.

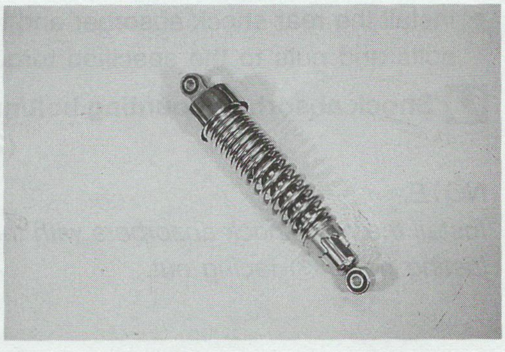


TOOL **09900-20606: Dial gauge (1/100 mm)**
09900-20701: Magnetic stand
09900-21304: V-block (100 mm)

Service Limit: 0.3 mm (0.01 in)

REAR SHOCK ABSORBER

Inspect the rear shock absorber for damage and oil leakage. If any defects are found, replace the rear shock absorber with a new one.



▲ CAUTION

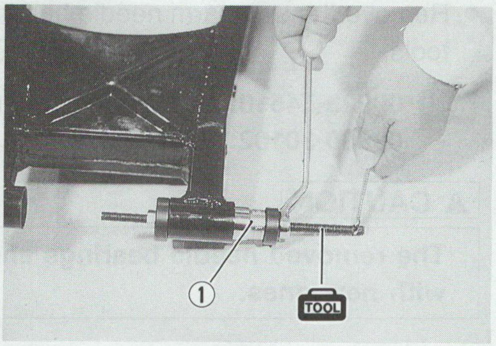
Do not attempt to disassemble the rear shock absorber. It is unserviceable.

REASSEMBLY AND REMOUNTING

Reassemble and remount the swingarm and rear shock absorber in the reverse order of removal and disassembly. Pay attention to the following points:

- Press the needle bearings into the swingarm pivot using a suitable socket ① and the special tool. (See p. 5-37.)

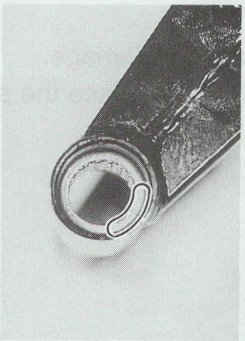
TOOL 09924-84521: Steering race installer



NOTE:
Install the needle bearings with the stamped mark facing out.

- Apply grease to the spacers, dust seals and needle bearings.

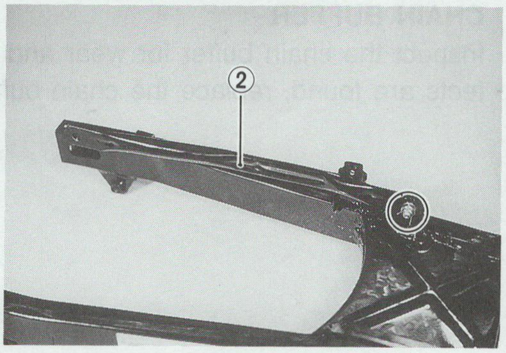
99000-25010: SUZUKI SUPER GREASE "A"



- Install the rear torque link ② to the swingarm.
- Tighten the rear torque link nut to the specified torque.

Rear torque link nut: 13 N·m (1.3 kg-m, 9.5 lb-ft)

- Install the new cotter pin.



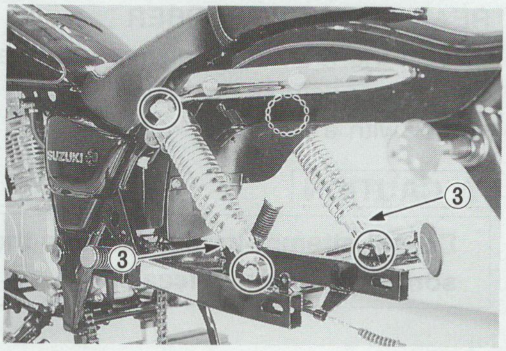
- Install the swingarm and tighten the swingarm pivot nut to the specified torque.

Swingarm pivot nut: 72 N·m (7.2 kg-m, 52.0 lb-ft)

- Install the rear shock absorber and tighten the mounting bolts and nuts to the specified torque.

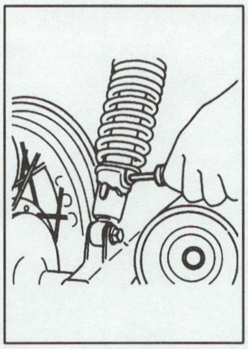
Shock absorber mounting bolt/nut: 29 N·m (2.9 kg-m, 21.0 lb-ft)

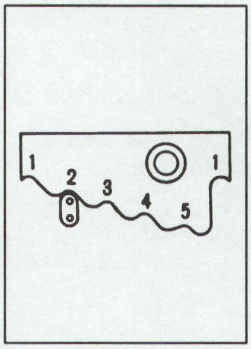
NOTE:
Install the rear shock absorbers with the spring tension adjusting holes ③ facing out.



- Install the rear wheel and rear brake. (See p. 5-36.)
- Adjust the rear shock absorber spring pre-load.

Spring pre-load (STD): 2/5 position





After installing the rear suspension and rear wheel, adjust the following before riding.

* Drive chain slack .... See p. 2-11
* Rear brake pedal free travel .... See p. 2-14
* Tire pressure .... See p. 2-15

ELECTRICAL SYSTEM

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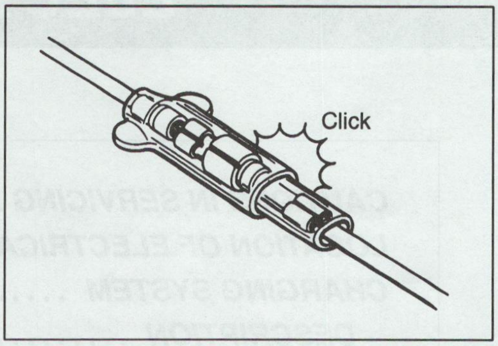
CAUTIONS IN SERVICING

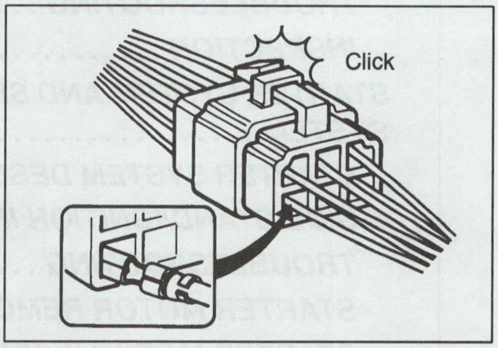
CONNECTORS

- When disconnecting a connector, be sure to hold the terminals; do not pull the lead wires.
- When connecting a connector, push it in so it is firmly attached.
- Inspect the connector for corrosion, contamination and any breakage in the cover.



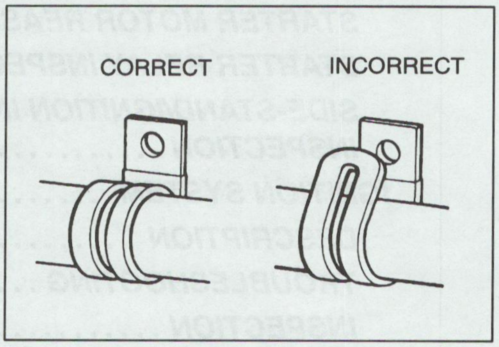
COUPLERS

- With a lock-type coupler, be sure to release the lock before disconnecting it. When connecting a connector, push it in until the lock clicks shut.
- When disconnecting the coupler, be sure to hold the coupler; do not pull the lead wires.
- Inspect each terminal on the coupler for looseness or bends.
- Inspect each terminal for corrosion and contamination.



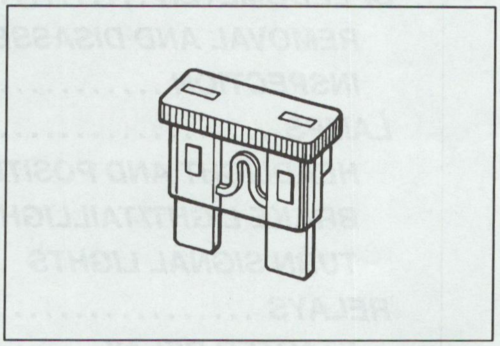
CLAMPS

- Refer to "WIRE, CABLE AND HOSE ROUTING" (See pp. 7-9 to -16.) for proper clamping procedures.
- Bend the clamp properly, as shown in the illustration.
- When clamping the wire harness, do not allow it to hang down.
- Do not use wire or any other substitute for the band–type clamp.



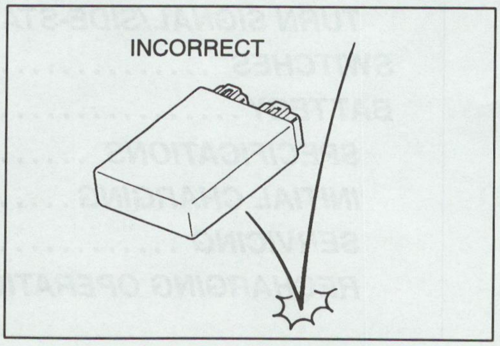
FUSES

- When a fuse blows, always investigate the cause, correct the problem and then replace the fuse.
- Do not use a fuse of a different capacity.
- Do not use any substitute for the fuse (eg., wire).

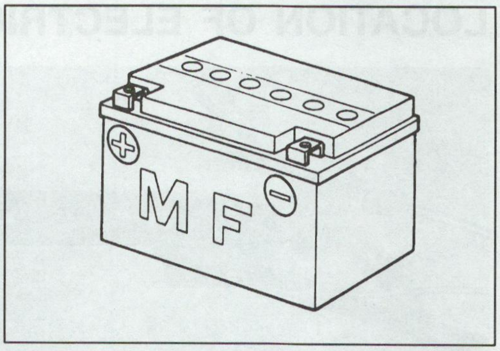


SEMI-CONDUCTOR EQUIPPED PARTS

- Do not drop any part that contains a semi-conductor (eg., ignitor unit, regulator/rectifier).
- When inspecting the part, follow the inspection instructions carefully. Neglecting proper procedures may cause this part to be damaged.

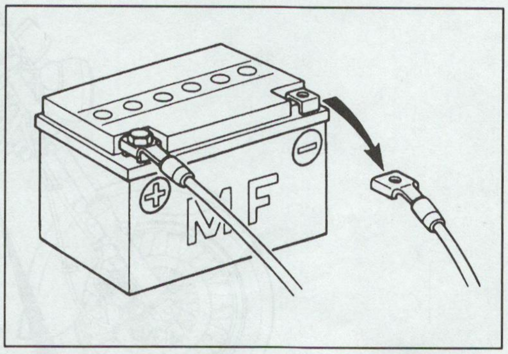


BATTERY

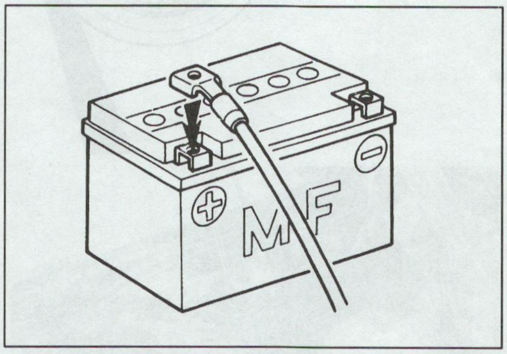


- The MF battery used in this motorcycle does not require maintenance (e.g., electrolyte level inspection, distilled water replenishing).
- During normal charging, no hydrogen gas is produced. However, if the battery is overcharged, hydrogen gas may be produced. Therefore, be sure that there are no fire or spark sources nearby (e.g., short-circuit) when charging the battery.
- Be sure to recharge the battery in a well-ventilated and open area.
- Note that the charging system for the MF battery is different from that of a conventional battery. Do not replace the MF battery with a conventional battery.

CONNECTING THE BATTERY



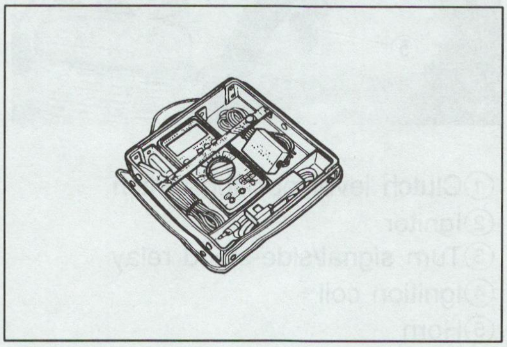
- When disconnecting terminals from the battery for disassembly or servicing, be sure to disconnect the battery (⊖) lead wire, first.
- When connecting the battery lead wires, be sure to connect the battery (⊕) lead wire, first.
- If the terminal is corroded, remove the battery, pour warm water over it and clean it using a wire brush.
- After connecting the battery, apply a light coat of grease to the battery terminals.
- Reinstall the cover over the battery (⊕) terminal.



WIRING PROCEDURE

- Properly route the wire harness according to "WIRE CABLE AND HOSE ROUTING". (See pp. 7-9 to -16.)

USING THE MULTI CIRCUIT TESTER

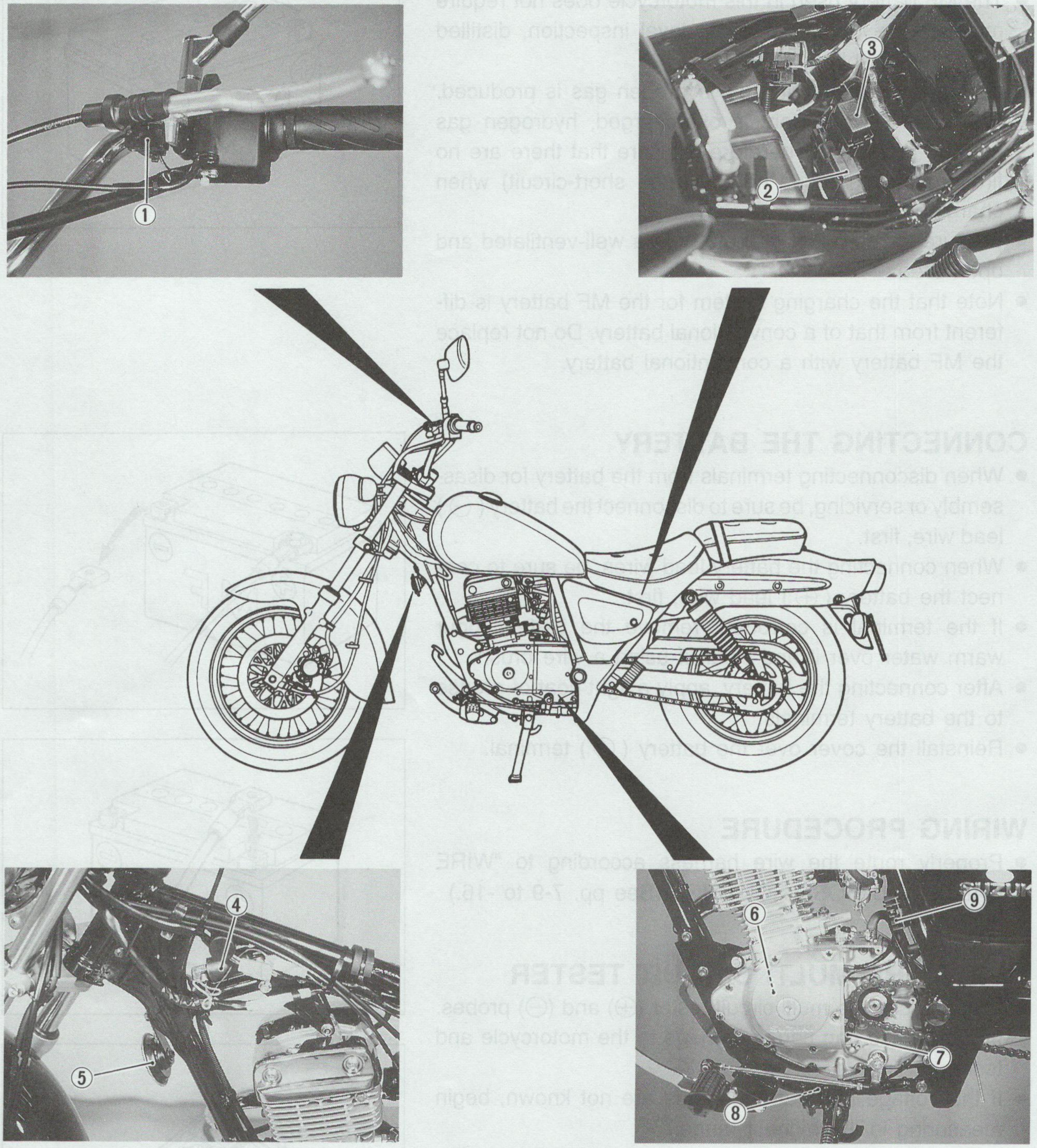


- Properly use the multi circuit tester (⊕) and (⊖) probes. Improper use can cause damage to the motorcycle and tester.
- If the voltage and current values are not known, begin measuring in the highest range.
- When measuring the resistance, make sure that no voltage is applied. If voltage is applied, the tester will be damaged.
- After using the tester, turn the switch to the OFF position.

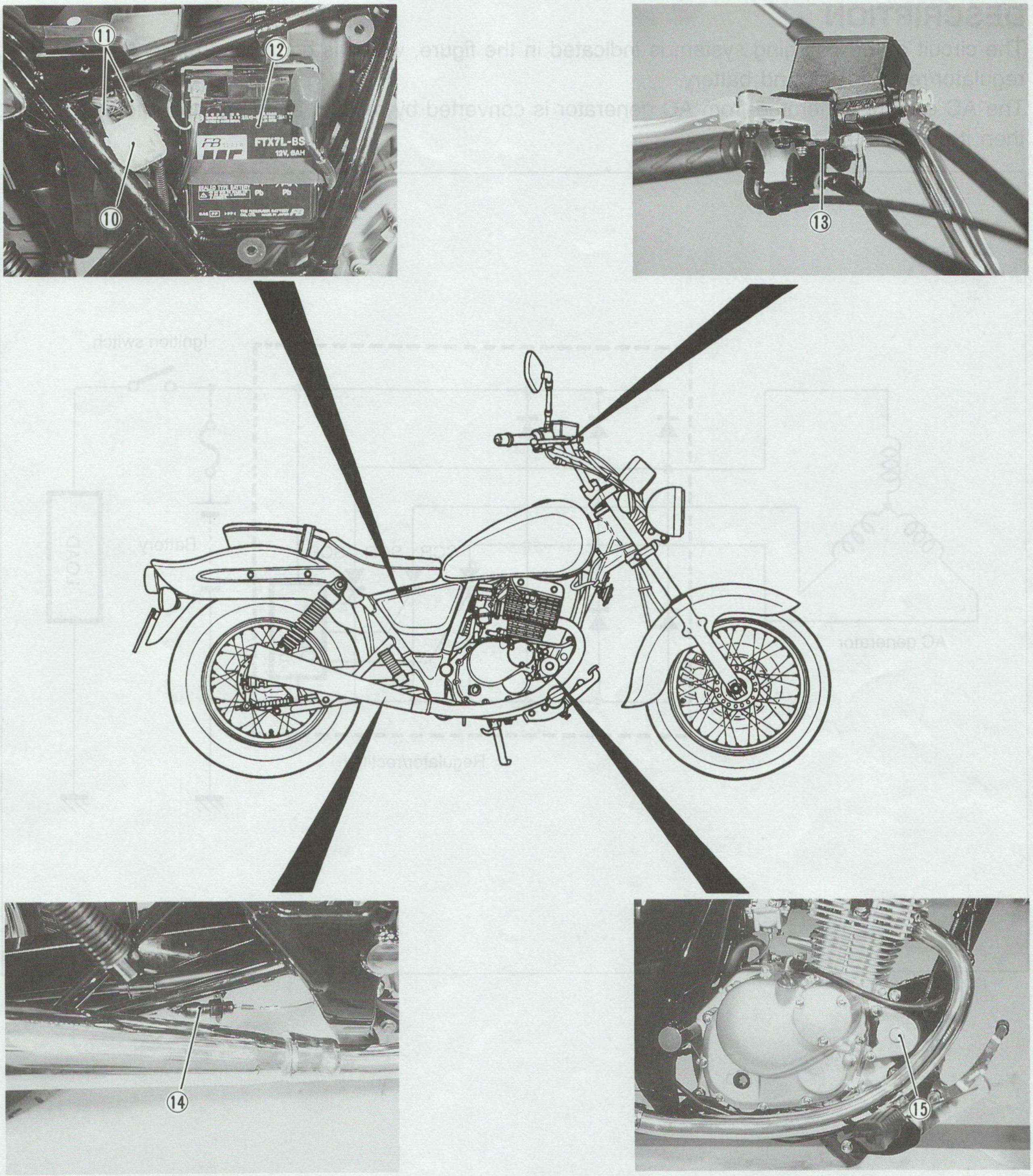
⚠ CAUTION

Before using the multi circuit tester, read its instruction manual.

LOCATION OF ELECTRICAL COMPONENTS



①Clutch lever position switch
②Ignitor
③Turn signal/side-stand relay
④Ignition coil
⑤Horn
⑥Generator
⑦Neutral switch
⑧Side-stand switch
⑨Regulator/rectifier


⑪
⑫
FTX7L-BS
12V, 6AH
⑩
⑬
⑭
⑮

⑩Starter relay
⑪Fuse
⑫Battery

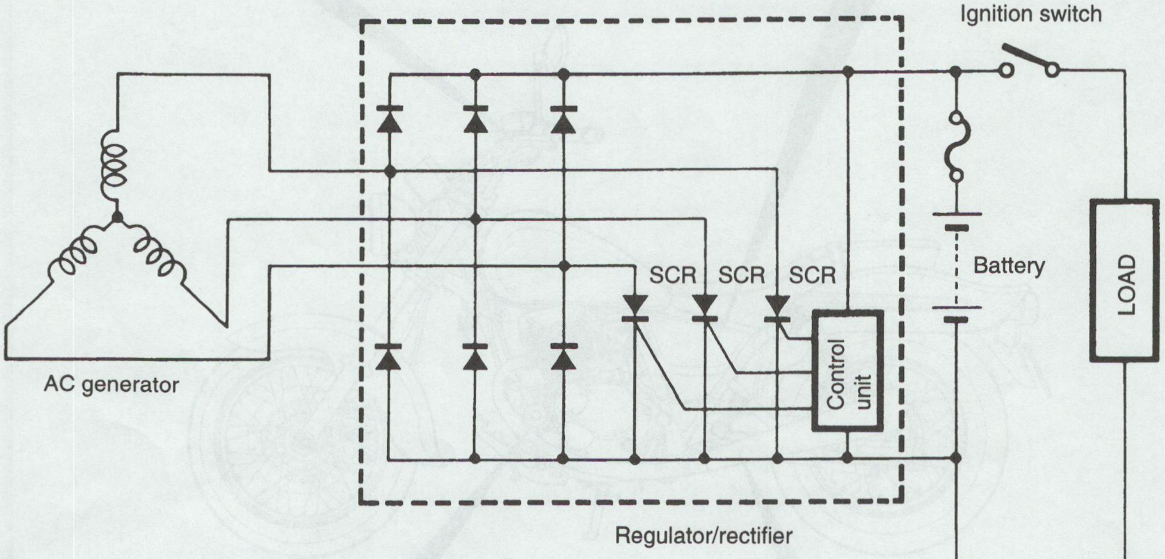
⑬Front brake light switch
⑭Rear brake light switch
⑮Starter motor

CHARGING SYSTEM

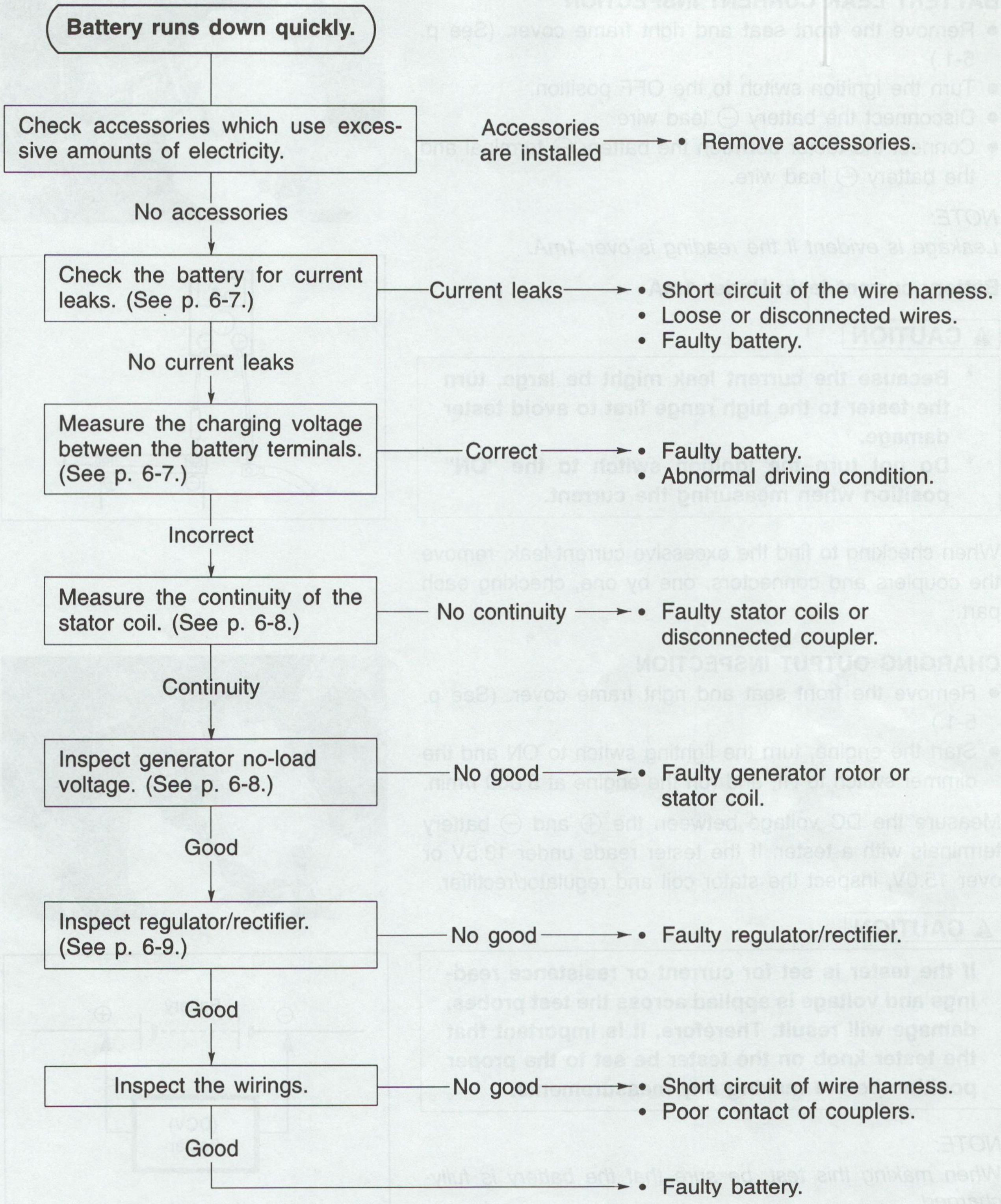
DESCRIPTION

The circuit of the charging system is indicated in the figure, which is composed of an AC generator, regulator/rectifier unit and battery.

The AC current generated from AC generator is converted by rectifier and is turned into DC current, then it charges the battery.


Ignition switch
SCR
SCR
SCR
Battery
LOAD
Control unit
AC generator
Regulator/rectifier

TROUBLESHOOTING



Battery runs down quickly.

Check accessories which use excessive amounts of electricity.
- Accessories are installed → • Remove accessories.
- No accessories ↓

Check the battery for current leaks. (See p. 6-7.)
- Current leaks → • Short circuit of the wire harness. • Loose or disconnected wires. • Faulty battery.
- No current leaks ↓

Measure the charging voltage between the battery terminals. (See p. 6-7.)
- Correct → • Faulty battery. • Abnormal driving condition.
- Incorrect ↓

Measure the continuity of the stator coil. (See p. 6-8.)
- No continuity → • Faulty stator coils or disconnected coupler.
- Continuity ↓

Inspect generator no-load voltage. (See p. 6-8.)
- No good → • Faulty generator rotor or stator coil.
- Good ↓

Inspect regulator/rectifier. (See p. 6-9.)
- No good → • Faulty regulator/rectifier.
- Good ↓

Inspect the wirings.
- No good → • Short circuit of wire harness. • Poor contact of couplers.
- Good → • Faulty battery.

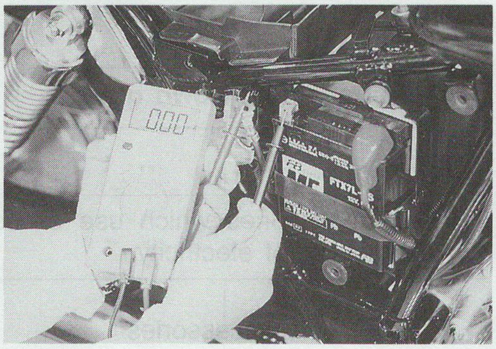
Others

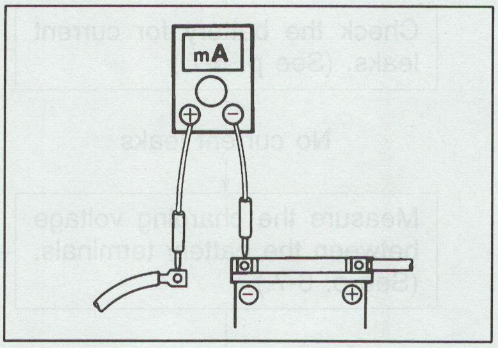
Battery overcharges	• Faulty regulator/rectifier • Faulty battery • Poor contact of stator coil coupler

INSPECTION

BATTERY LEAK CURRENT INSPECTION

- Remove the front seat and right frame cover. (See p. 5-1.)
- Turn the ignition switch to the OFF position.
- Disconnect the battery ⊖ lead wire.
- Connect the tester between the battery ⊖ terminal and the battery ⊖ lead wire.





NOTE:
Leakage is evident if the reading is over 1mA.

Battery current leak: Under 1mA

▲ CAUTION

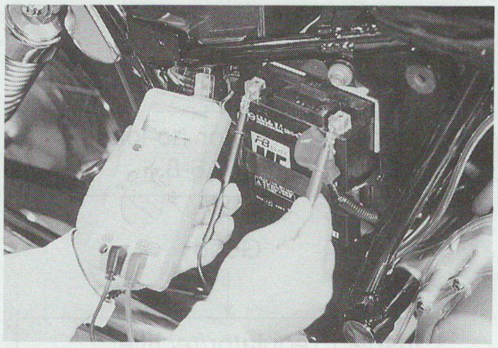
- * **Because the current leak might be large, turn the tester to the high range first to avoid tester damage.**
- * **Do not turn the ignition switch to the "ON" position when measuring the current.**

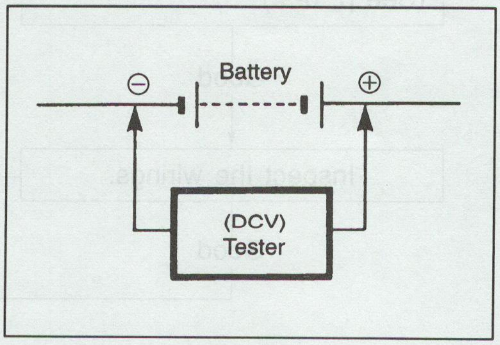
When checking to find the excessive current leak, remove the couplers and connectors, one by one, checking each part.

CHARGING OUTPUT INSPECTION

- Remove the front seat and right frame cover. (See p. 5-1.)
- Start the engine, turn the lighting switch to ON and the dimmer switch to HI, and run the engine at 5 000 r/min.

Measure the DC voltage between the ⊕ and ⊖ battery terminals with a tester. If the tester reads under 13.5V or over 15.0V, inspect the stator coil and regulator/rectifier.





▲ CAUTION

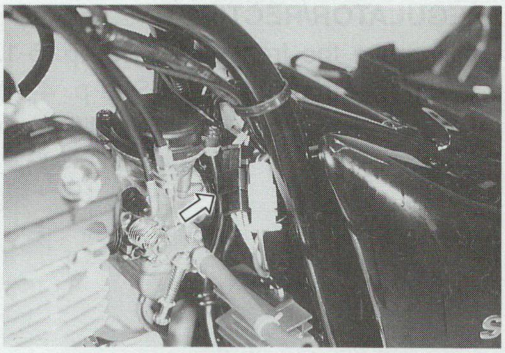
If the tester is set for current or resistance readings and voltage is applied across the test probes, damage will result. Therefore, it is important that the tester knob on the tester be set to the proper position before making any measurements.

NOTE:
When making this test, be sure that the battery is fully-charged.

Charging output
Standard: 13.5–15.0V at 5 000 r/min.

STATOR COIL RESISTANCE

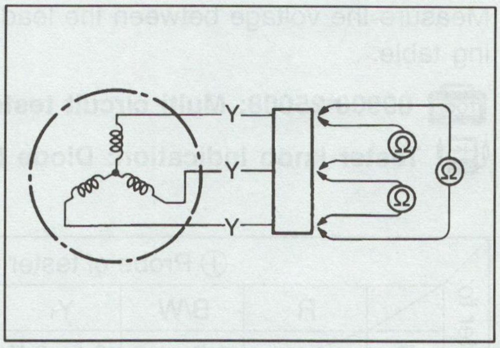
- Remove the front seat. (See p. 5-1.)
- Remove the fuel tank. (See p. 4-1.)
- Disconnect the stator coil coupler.



Measure the resistance between the three lead wires using a tester.

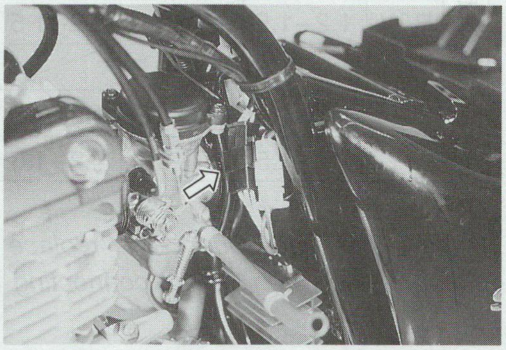
If the resistance is incorrect, replace the stator coil with a new one.

Stator coil resistance: 0.3–1.5Ω



GENERATOR NO-LOAD PERFORMANCE INSPECTION

- Remove the front seat. (See p. 5-1.)
- Remove the fuel tank. (See p. 4-1.)
- Disconnect the stator coil coupler.
- Start the engine and keep it running at 5 000 r/min.

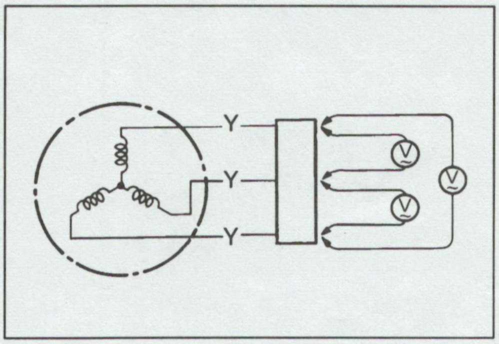


Measure the voltage between the three lead wires using a tester.

If the tester reads under the specified value, replace the stator coil and pick-up coil, or the generator rotor with a new one.

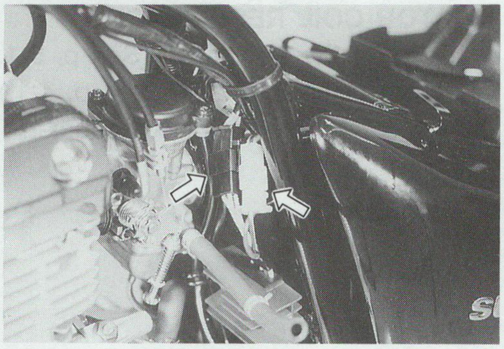
Generator no-load performance:

More than 45V (AC) at 5 000 r/min
(When engine is cold)



REGULATOR/RECTIFIER

- Remove the front seat. (See p. 5-1.)
- Remove the fuel tank. (See p. 4-1.)
- Disconnect the regulator/rectifier couplers.



Measure the voltage between the lead wires in the following table.

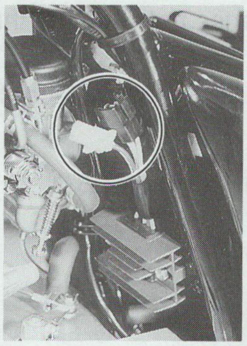
09900-25008: Multi circuit tester set

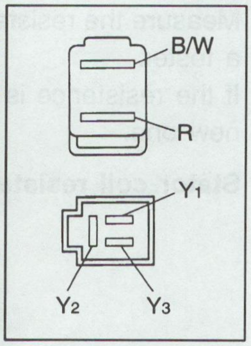
Tester knob indication: Diode test (─|◀─)

Unit: V

⊖ Probe of tester to:	⊕ Probe of tester to: R	B/W	Y_1	Y_2	Y_3
R		0.5–1.0	0.3–0.7	0.3–0.7	0.3–0.7
B/W	1.2–1.5		1.2–1.5	1.2–1.5	1.2–1.5
Y_1	1.2–1.5	0.3–0.7		1.2–1.5	1.2–1.5
Y_2	1.2–1.5	0.3–0.7	1.2–1.5		1.2–1.5
Y_3	1.2–1.5	0.3–0.7	1.2–1.5	1.2–1.5	

NOTE:
If the tester lead under 1.4V, replace the battery of multi circuit tester when do not connecting the tester probes.



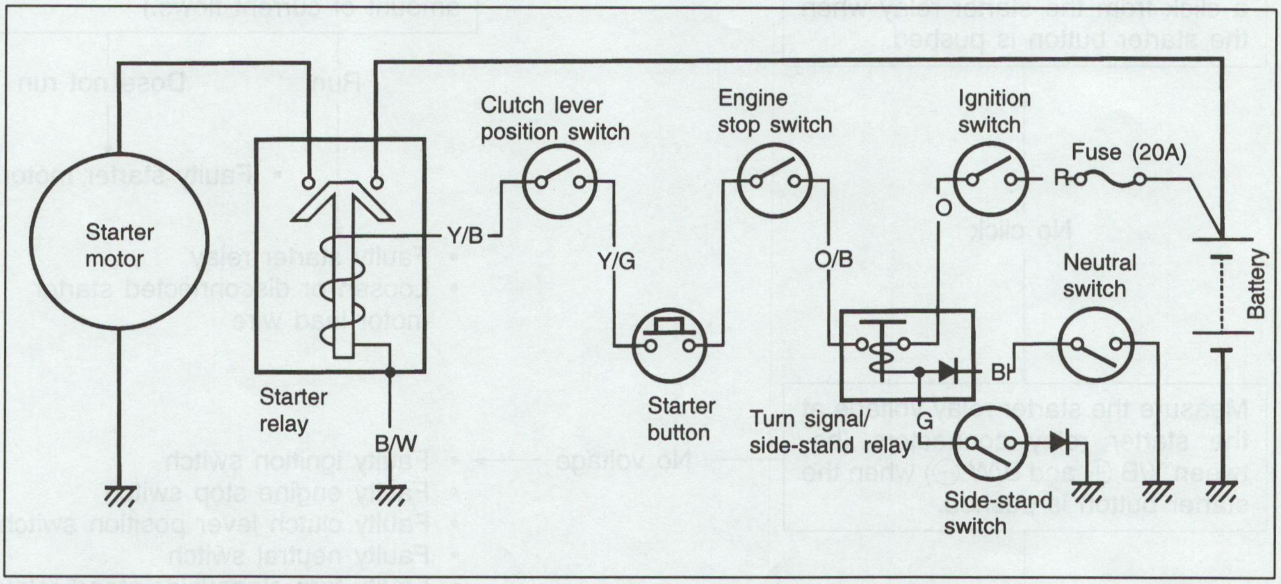


WIRE COLOR
R: Red
Y: Yellow
B/W: Black with White tracer

STARTER SYSTEM AND SIDE-STAND/IGNITION INTERLOCK SYSTEM

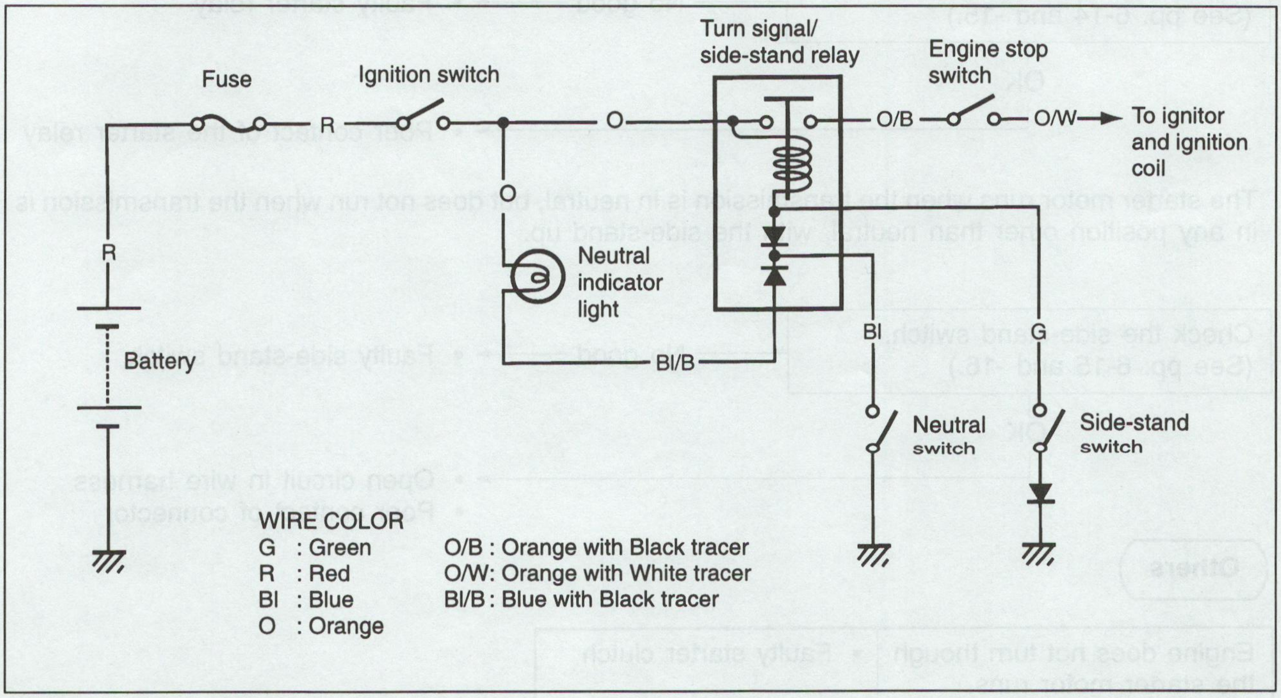
STARTER SYSTEM DESCRIPTION

The starter system consists of the following components: the starter motor, starter relay, clutch lever position switch, turn signal/side-stand relay, side-stand switch, neutral switch, starter button, engine stop switch, ignition switch and battery. Pressing the starter button (on the right handlebar switch) energizes the starter relay, causing the contact points to close, thus completing the circuit from the starter motor to the battery. The starter motor draws about 80 amperes to start the engine.


Starter motor
Starter relay
Y/B
B/W
Clutch lever position switch
Y/G
Starter button
Engine stop switch
O/B
Turn signal/ side-stand relay
Ignition switch
O
R
Fuse (20A)
Neutral switch
Bl
G
Side-stand switch
Battery

SIDE-STAND/IGNITION INTERLOCK SYSTEM DESCRIPTION

This side-stand/ignition interlock system prevents the motorcycle from being started with the side-stand down. The system is operated by an electric circuit provided between the battery and ignition coil.


Fuse
R
Ignition switch
O
Turn signal/ side-stand relay
Engine stop switch
O/B
O/W
To ignitor and ignition coil
Neutral indicator light
Bl/B
Bl
G
Neutral switch
Side-stand switch
R
Battery
WIRE COLOR
G : Green
R : Red
Bl : Blue
O : Orange
O/B : Orange with Black tracer
O/W: Orange with White tracer
Bl/B : Blue with Black tracer

TROUBLESHOOTING

Starter motor will not run.

The transmission is in neutral. Grasp the clutch lever. Turn on the ignition switch with the engine stop switch in "RUN" position. Listen for a click from the starter relay when the starter button is pushed.

Clicks → Check if the starter motor runs when its terminal is connected to the battery ⊕ terminal. (Do not use a thin "wire" because a large amount of current flows.)

Run →
- Faulty starter relay
- Loosen or disconnected starter motor lead wire

Dose not run →
- Faulty starter motor

No click

Measure the starter relay voltage at the starter relay connectors (between Y/B ⊕ and B/W ⊖) when the starter button is pushed.

No voltage →
- Faulty ignition switch
- Faulty engine stop switch
- Faulty clutch lever position switch
- Faulty neutral switch
- Faulty turn signal/side-stand relay
- Faulty starter button
- Poor contact of connector
- Open circuit in wire harness

Voltage

Check the starter relay. (See pp. 6-14 and -15.)

No good →
- Faulty starter relay

OK →
- Poor contact of the starter relay

The starter motor runs when the transmission is in neutral, but does not run when the transmission is in any position other than neutral, with the side-stand up.

Check the side-stand switch. (See pp. 6-15 and -16.)

No good →
- Faulty side-stand switch

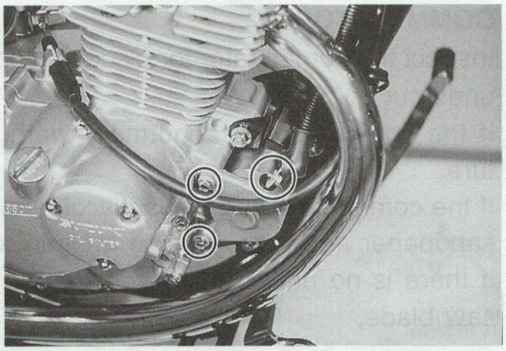
OK →
- Open circuit in wire harness
- Poor contact of connector

Others

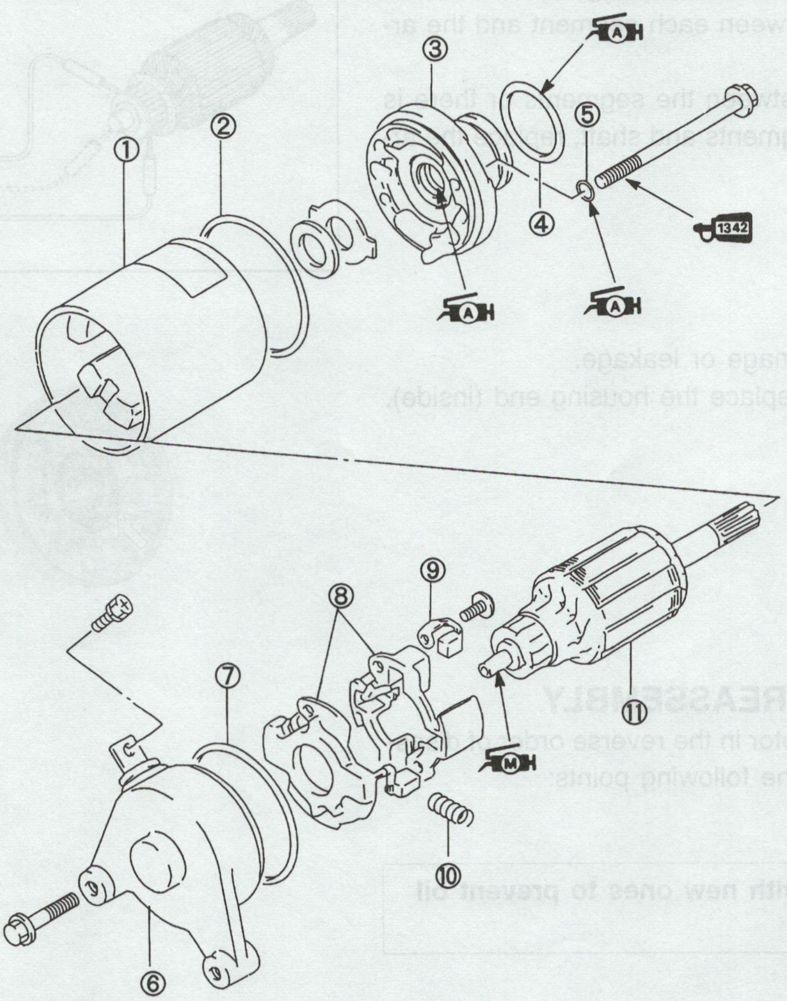
Engine does not turn though the starter motor runs.	• Faulty starter clutch

STARTER MOTOR REMOVAL AND DISASSEMBLY

- Disconnect the starter motor lead wire.
- Remove the starter motor.



- Disassemble the starter motor, as shown in the illustration.



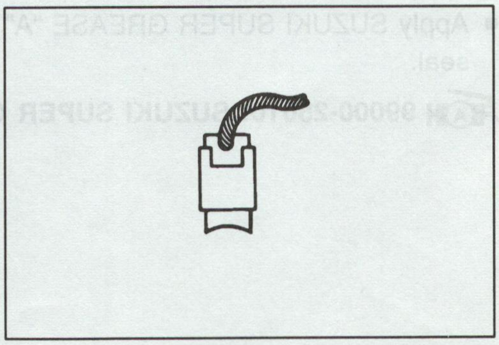
① Starter motor case
② O-ring
③ Housing end (Inside)
④ O-ring
⑤ O-ring (2 pcs)
⑥ Housing end (Outside)
⑦ O-ring
⑧ Brush holder
⑨ Brush (4 pcs)
⑩ Brush spring (4 pcs)
⑪ Armature

STARTER MOTOR INSPECTION

CARBON BRUSH

Inspect the brushes for abnormal wear, crack or smoothness in the brush holder.

If either carbon brush is defective, replace the brush assembly.



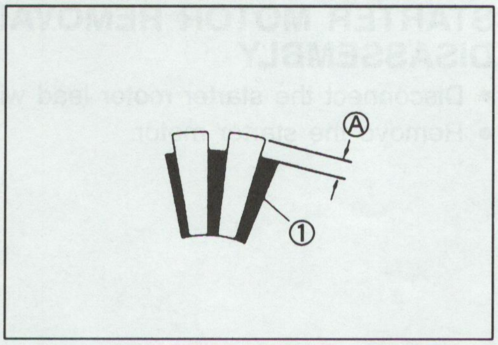
COMMUTATOR

Inspect the commutator for discoloration, abnormal wear or undercut Ⓐ.

If the commutator is abnormally worn, replace the armature.

If the commutator surface is discolored, polish it with #400 sandpaper and wipe it using a clean, dry cloth.

If there is no undercut, scrape out the insulator ① with a saw blade.

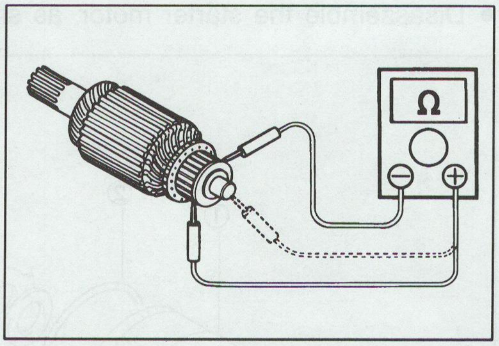


ARMATURE COIL INSPECTION

Measure for continuity between each segment.

Measure for continuity between each segment and the armature shaft.

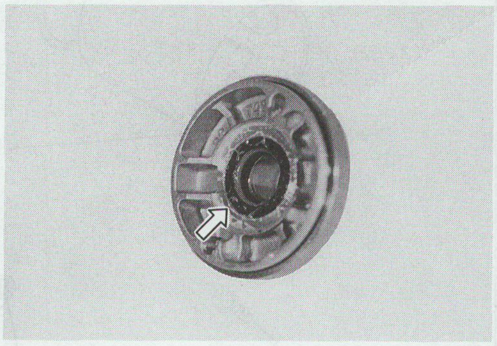
If there is no continuity between the segments or there is continuity between the segments and shaft, replace the armature with a new one.



OIL SEAL INSPECTION

Check the seal lip for damage or leakage.

If any damage is found, replace the housing end (inside).



STARTER MOTOR REASSEMBLY

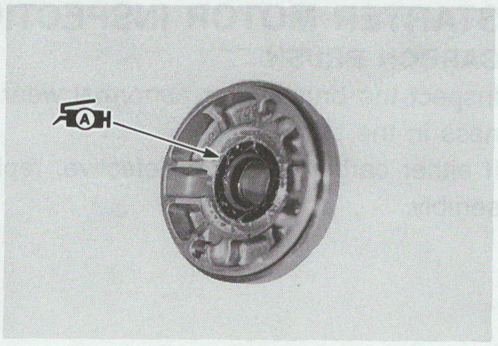
Reassemble the starter motor in the reverse order of disassembly. Pay attention to the following points:

⚠ CAUTION

Replace the O-rings with new ones to prevent oil leakage and moisture.

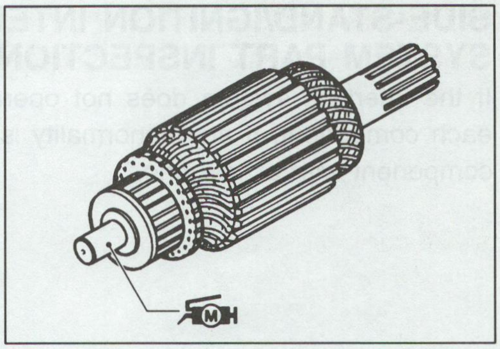
- Apply SUZUKI SUPER GREASE “A” to the lip of the oil seal.

99000-25010: SUZUKI SUPER GREASE “A”



- Apply a small quantity of SUZUKI MOLY PASTE to the armature shaft.

99000-25140: SUZUKI MOLY PASTE

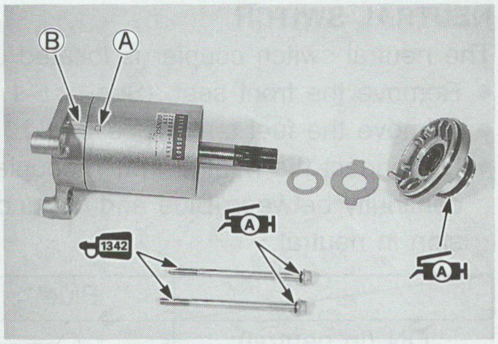


- Align the match mark Ⓐ on the starter motor case with the match mark Ⓑ on the housing end.
- Apply SUZUKI SUPER GREASE "A" to the O-rings.

99000-25010: SUZUKI SUPER GREASE "A"

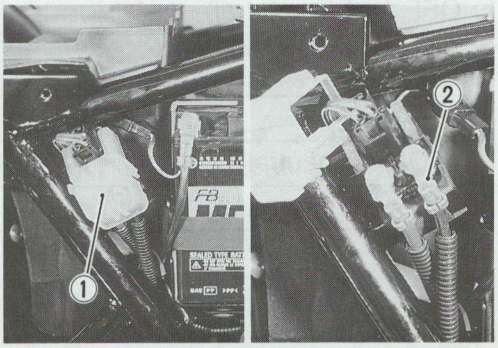
- Apply a small quantity of THREAD LOCK "1342" to the starter motor housing bolts.

99000-32050: THREAD LOCK "1342"

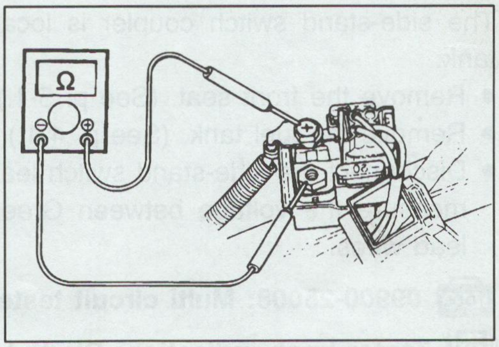


STARTER RELAY INSPECTION

- Remove the front seat and right frame cover. (See p. 5-1.)
- Remove the starter relay cover ①.
- Disconnect the starter motor lead wire ②.



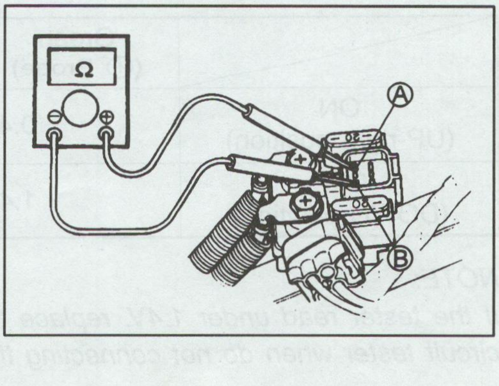
Turn on the ignition switch, grasp the clutch lever, push the starter button and check for continuity between the ⊕ and ⊖ terminals. If no continuity is found, the starter relay is defective and must be replaced with a new one.



- Disconnect the starter relay lead wire coupler.

Measure the starter relay resistance between the terminals (Ⓐ and Ⓑ).

Starter relay resistance: 3–6Ω



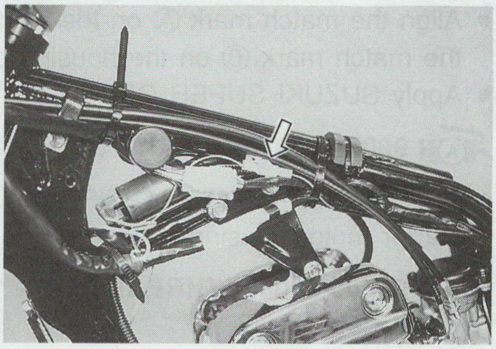
SIDE-STAND/IGNITION INTERLOCK SYSTEM PART INSPECTION

If the interlock system does not operate properly, check each component. If any abnormality is found, replace the component with a new one.

NEUTRAL SWITCH

The neutral switch coupler is located under the fuel tank.

- Remove the front seat. (See p. 5-1.)
- Remove the fuel tank. (See p. 4-1.)
- Disconnect the neutral switch coupler and measure the continuity between Blue and Ground with the transmission in neutral.



	Blue	Ground
ON (in neutral)	○—	—○
OFF (not in neutral)		

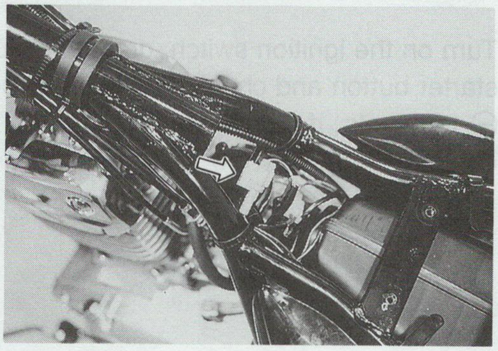
For E-22

	Blue	Black/White
ON (in neutral)	○—	—○
OFF (not in neutral)		

SIDE-STAND SWITCH

The side-stand switch coupler is located under the fuel tank.

- Remove the front seat. (See p. 5-1.)
- Remove the fuel tank. (See p. 4-1.)
- Disconnect the side-stand switch lead wire coupler and measure the voltage between Green and Black/White lead wires.



TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Diode test (⊣◀)

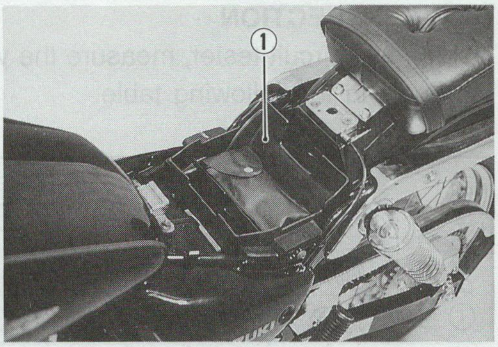
	Green (⊕ Probe)	Black/White (⊖ Probe)
ON (UP-right position)	0.4–0.6 V	
OFF (DOWN position)	1.4–1.5 V	

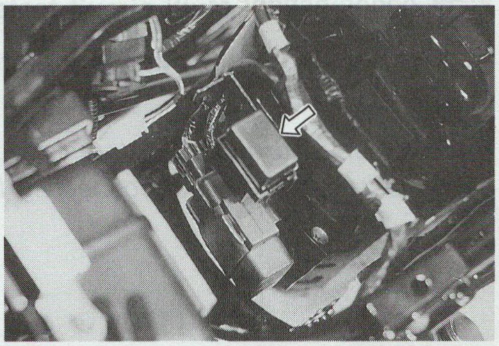
NOTE:
If the tester read under 1.4V, replace the battery of multi circuit tester when do not connecting the tester probes.

TURN SIGNAL/SIDE-STAND RELAY

The turn signal relay is corporated with the side-stand relay and diode to form the one component part which is called the turn signal/side-stand relay.
It is located under the luggage box.

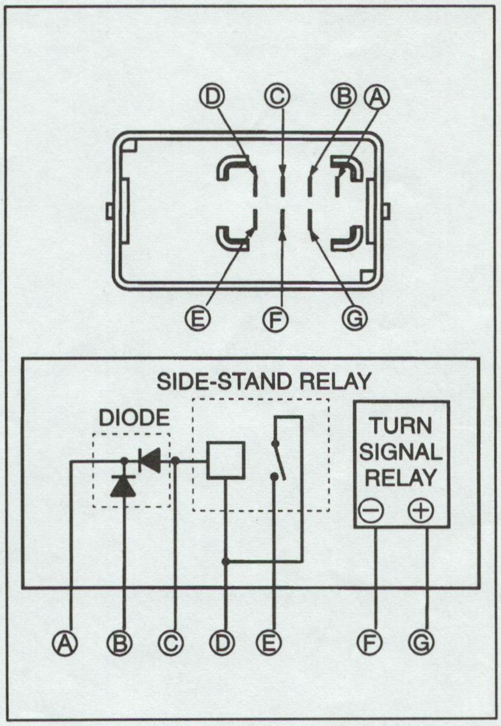
- Remove the front seat. (See p. 5-1.)
- Remove the luggage box ①.





SIDE-STAND RELAY INSPECTION

First check the insulation between Ⓓ and Ⓔ terminals with tester. Then apply 12 volts to Ⓓ and Ⓒ terminals, ⊕ to Ⓓ and ⊖ to Ⓒ, and check the continuity between Ⓓ and Ⓔ. If there is no continuity, replace turn signal/side-stand relay with a new one.



DIODE INSPECTION

Using multi circuit tester, measure the voltage between the terminals in the following table.

Unit: V

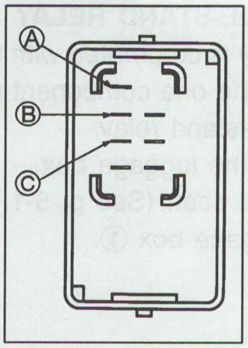
⊖ Probe of tester to:	⊕ Probe of tester to:	
	Ⓒ, Ⓑ	Ⓐ
Ⓒ, Ⓑ		1.4–1.5
Ⓐ	0.4–0.6	

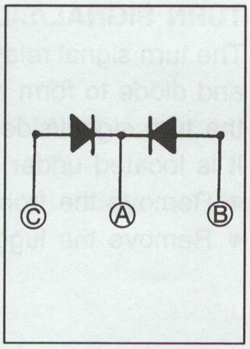
09900-25008: Multi circuit tester set

Tester knob indication: Diode test (-|◀-)

NOTE:

If the tester read under 1.4V, replace the battery of multi circuit tester when do not connecting the tester probes.



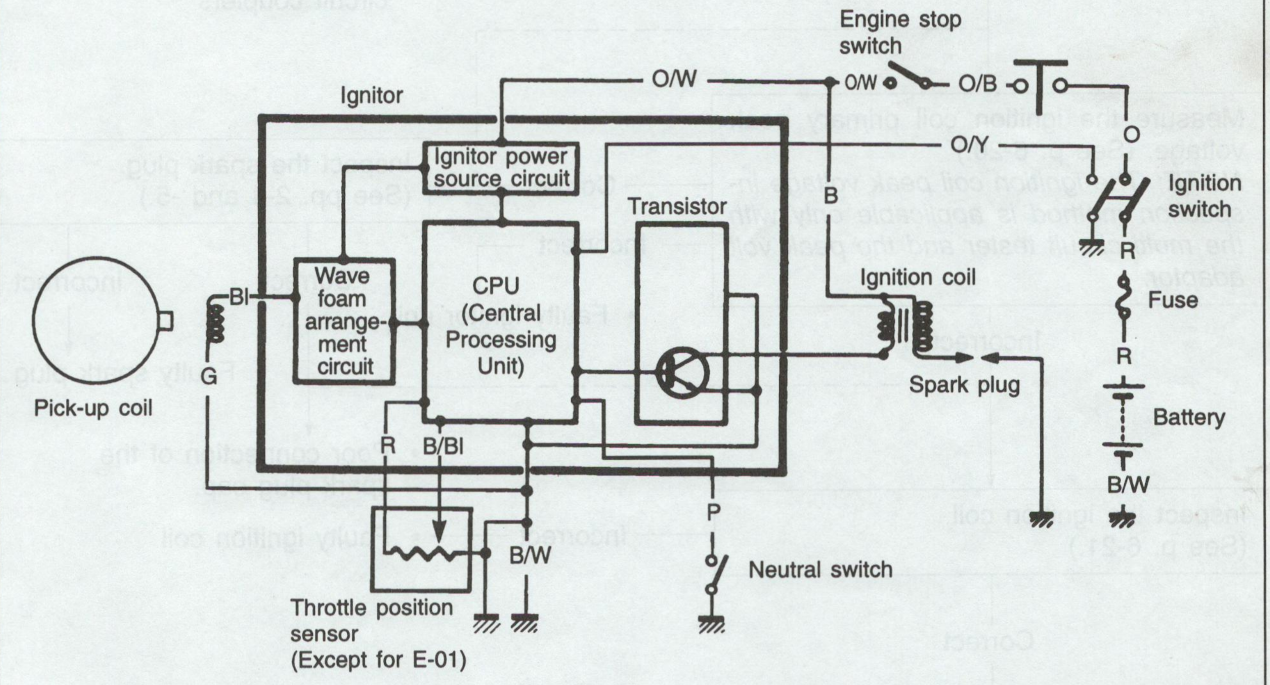


IGNITION SYSTEM (DIGITAL IGNITOR)

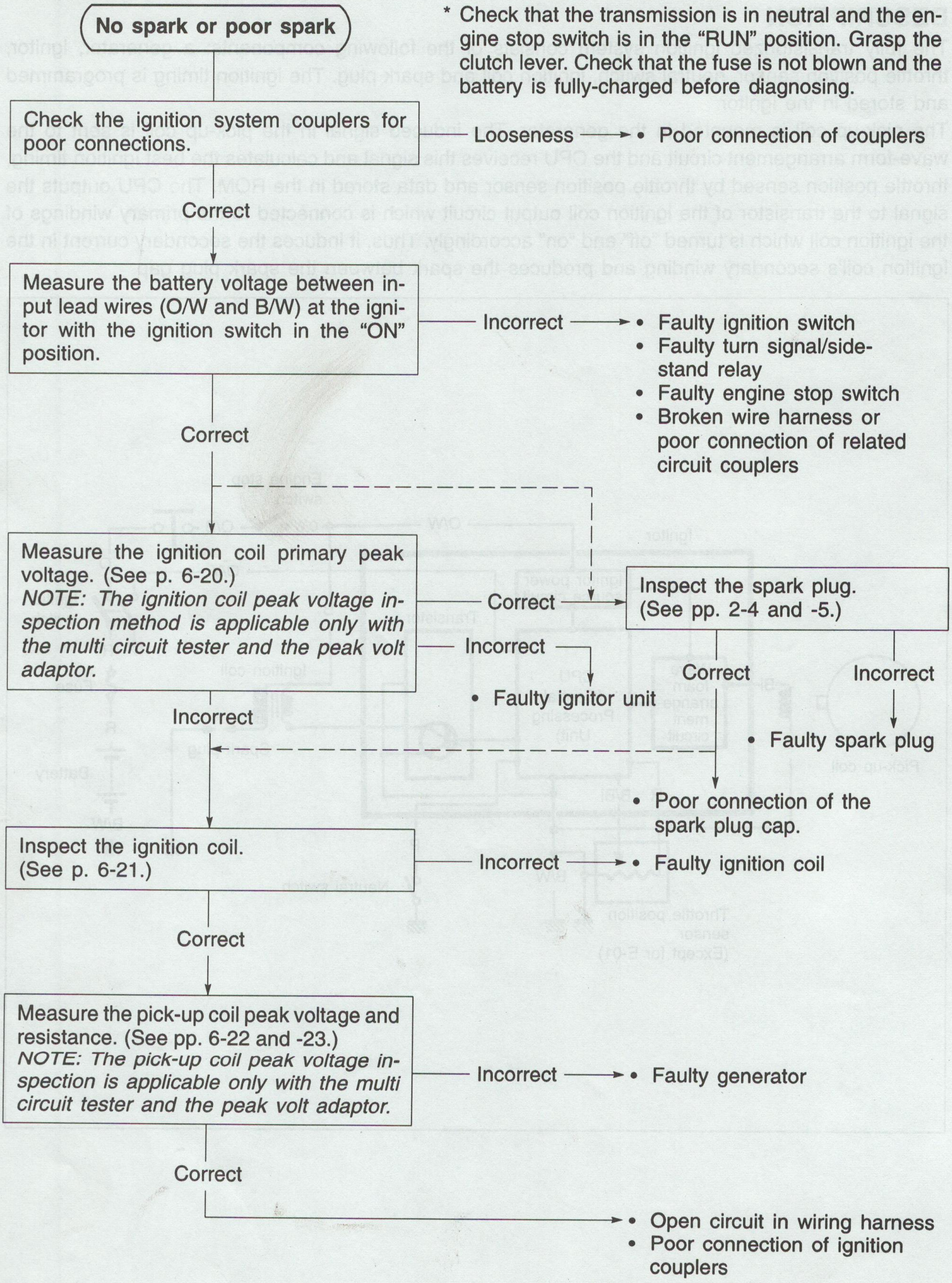
DESCRIPTION

The fully transistorized ignition system consists of the following components: a generator, ignitor, throttle position sensor, neutral switch, ignition coil and spark plug. The ignition timing is programmed and stored in the ignitor.

The pick-up coil is mounted in the generator. The induced signal in the pick-up coil is sent to the wave-form arrangement circuit and the CPU receives this signal and calculates the best ignition timing, throttle position sensed by throttle position sensor and data stored in the ROM. The CPU outputs the signal to the transistor of the ignition coil output circuit which is connected to the primary windings of the ignition coil which is turned "off" and "on" accordingly. Thus, it induces the secondary current in the ignition coil's secondary winding and produces the spark between the spark plug gap.


Engine stop switch
O/W
O/W
O/B
Ignitor
Ignitor power source circuit
O/Y
O
B
Transistor
Ignition switch
R
Ignition coil
Fuse
Wave foam arrange-ment circuit
CPU (Central Processing Unit)
Bl
G
R
Pick-up coil
Spark plug
Battery
R
B/Bl
B/W
P
B/W
Neutral switch
Throttle position sensor (Except for E-01)

TROUBLESHOOTING



* Check that the transmission is in neutral and the engine stop switch is in the "RUN" position. Grasp the clutch lever. Check that the fuse is not blown and the battery is fully-charged before diagnosing.

No spark or poor spark

Check the ignition system couplers for poor connections.

Looseness → • Poor connection of couplers

Correct

Measure the battery voltage between input lead wires (O/W and B/W) at the ignitor with the ignition switch in the "ON" position.

Incorrect →
- Faulty ignition switch
- Faulty turn signal/side-stand relay
- Faulty engine stop switch
- Broken wire harness or poor connection of related circuit couplers

Correct

Measure the ignition coil primary peak voltage. (See p. 6-20.)
NOTE: The ignition coil peak voltage inspection method is applicable only with the multi circuit tester and the peak volt adaptor.

Correct → Inspect the spark plug. (See pp. 2-4 and -5.)

Correct → • Poor connection of the spark plug cap.

Incorrect → • Faulty spark plug

Incorrect → • Faulty ignitor unit

Incorrect

Inspect the ignition coil. (See p. 6-21.)

Incorrect → • Faulty ignition coil

Correct

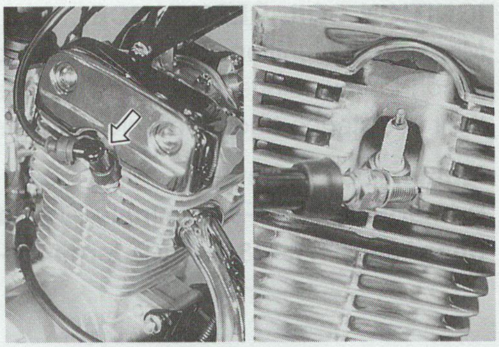
Measure the pick-up coil peak voltage and resistance. (See pp. 6-22 and -23.)
NOTE: The pick-up coil peak voltage inspection is applicable only with the multi circuit tester and the peak volt adaptor.

Incorrect → • Faulty generator

Correct →
- Open circuit in wiring harness
- Poor connection of ignition couplers

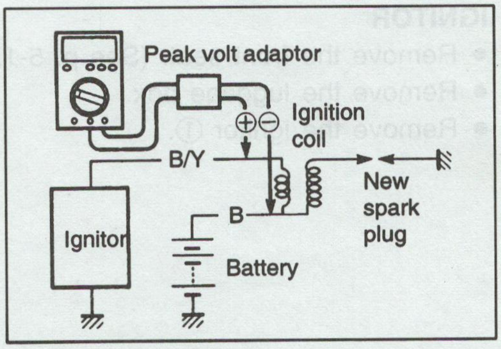
INSPECTION

IGNITION COIL PRIMARY PEAK VOLTAGE



- Remove the front seat. (See p. 5-1.)
- Remove the fuel tank. (See p. 4-1.)
- Disconnect the spark plug cap.
- Connect new spark plug to the spark plug cap and ground it to the cylinder head.

NOTE:
Make sure that the spark plug cap and spark plug is connected properly and the battery is fully-charged.

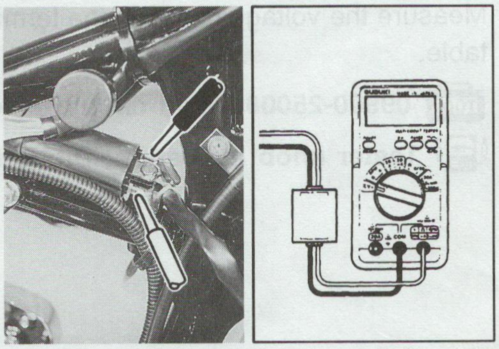


Measure ignition coil primary peak voltage in the following procedure.

- Connect the multi circuit tester with the peak volt adaptor as follows.

⊕ Probe: Black with Yellow tracer lead wire connector
⊖ Probe: Black lead wire connector

NOTE:
Do not disconnect the ignition coil primary wire.



TOOL 09900-25008: Multi circuit tester set

▲ CAUTION

When using the multi circuit tester and peak volt adaptor, refer to the appropriate instruction manual.

- Shift the transmission into neutral, turn the ignition switch to the "ON" position and grasp the clutch lever.
- Press the starter button and allow the engine to crank for a few seconds, and then measure the ignition coil primary peak voltage.
- Repeat the above procedure a few times and measure the highest ignition coil primary peak voltage.

Tester knob indication: Voltage (⎓)

Ignition coil primary peak voltage: More than 200 V

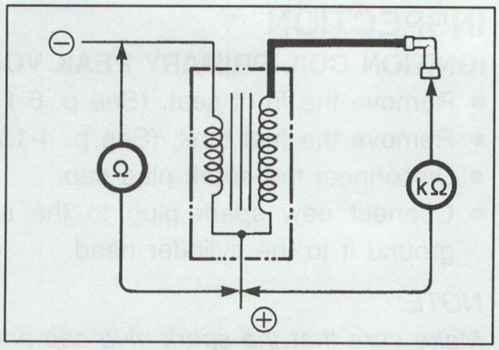
▲WARNING

While testing, do not touch the tester probes and spark plug to prevent receiving an electric shock.

If the voltage is lower than the standard value, inspect the ignition coil and the pick-up coil. (See pp. 6-21 to -23.)

IGNITION COIL RESISTANCE

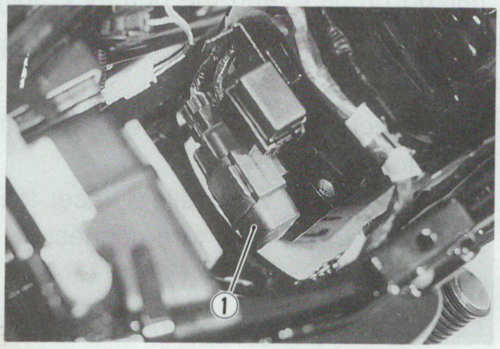
Measure the ignition coil resistance in both the primary and secondary windings. If the windings are in sound condition, their resistance should be close to the specified values.



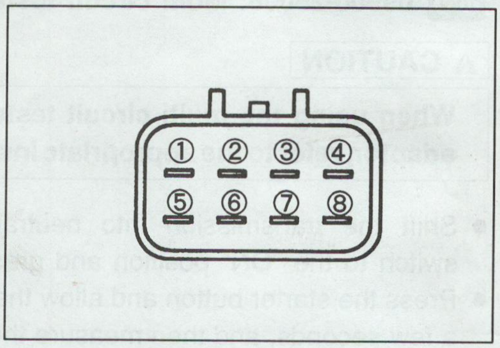
Ignition coil resistance
Primary: 3–5Ω (⊕ terminal–⊖ terminal)
Secondary: 17–28 kΩ (⊕ terminal–Spark plug cap)

IGNITOR

- Remove the front seat. (See p. 5-1.)
- Remove the luggage box.
- Remove the ignitor ①.



Measure the voltage between the terminals in the following table.



TOOL 09900-25008: Multi circuit tester set

Tester knob indication: Diode test (⊣◀)

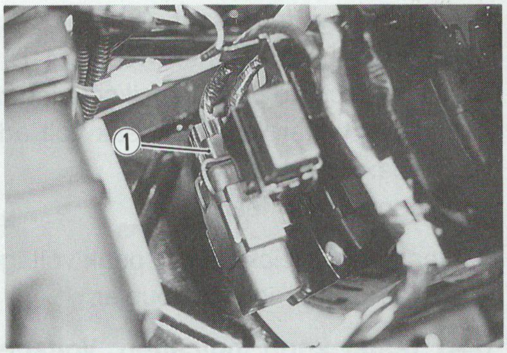
	⊕ Probe of tester to:							
⊖ Probe of tester to:	①	②	③	④	⑤	⑥	⑦	⑧
①		1.2–1.5	0.7–1.0	1.2–1.5	0.3–0.4	0.8–1.0	0.3–0.5	0.6–0.9
②	0.9–1.4		0.9–1.4	1.2–1.5	1.0–1.3	1.0–1.2	0.9–1.1	0.9–1.3
③	0.7–1.0	1.2–1.5		1.2–1.5	0.8–1.0	0.8–1.0	0.5–0.8	0.2–0.4
④	0.7–1.0	1.2–1.5	0.6–1.0		0.9–1.1	0.8–1.0	0.4–0.5	0.5–0.8
⑤	0.3–0.4	1.2–1.5	0.7–1.0	1.2–1.5		0.8–1.0	0.5–0.6	0.7–1.0
⑥	0.7–1.1	1.2–1.5	0.8–1.1	1.2–1.5	0.9–1.1		0.6–0.8	0.7–1.0
⑦	0.4–0.7	1.2–1.5	0.5–0.8	1.2–1.5	0.6–0.8	0.6–0.8		0.4–0.6
⑧	0.6–1.0	1.2–1.5	0.1–0.4	1.2–1.5	0.8–1.0	0.8–1.0	0.4–0.6	

PICK-UP COIL PEAK VOLTAGE

- Remove the front seat. (See p. 5-1.)
- Remove the luggage box.

NOTE:
Be sure that all of the couplers are connected properly and the battery is fully-charged.

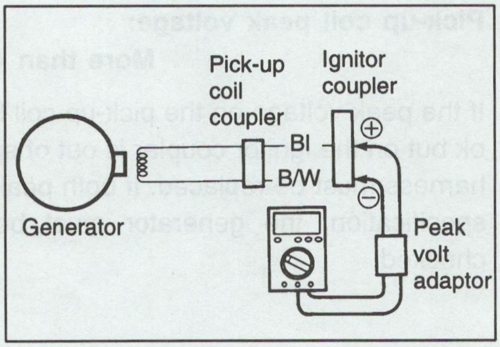
- Disconnect the ignitor coupler ① at the ignitor.



- Measure the pick-up coil peak voltage between the Blue and Black/White lead wires on the ignitor coupler.
- Connect the multi circuit tester with the peak volt adaptor as follows.

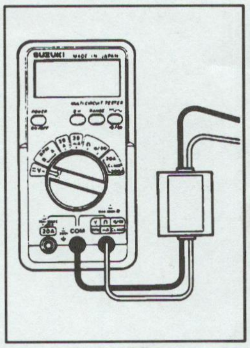
⊕ Probe: Blue lead wire
⊖ Probe: Black with White tracer lead wire

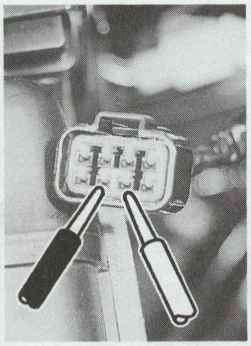
09900-25008: Multi circuit tester set



▲ CAUTION

When using the multi circuit tester and peak volt adaptor, refer to the appropriate instruction manual.



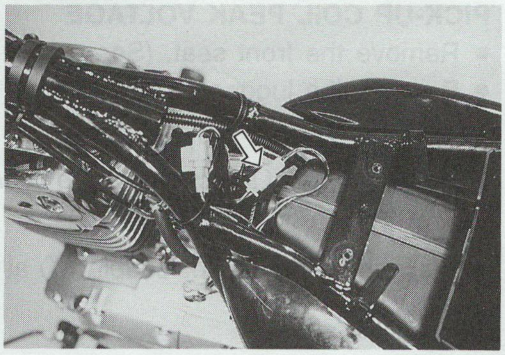


- Shift the transmission into neutral, turn the ignition switch to the “ON” position and grasp the clutch lever.
- Press the starter button and allow the engine to crank for a few seconds, and then measure the pick-up coil peak voltage.
- Repeat the above procedure a few times and measure the highest pick-up coil peak voltage.

Tester knob indication: Voltage (⎓)

Pick-up coil peak voltage:
More than 4.0 V (Blue–Black/White)

If the peak voltage measured on the ignitor coupler is lower than the standard value, measure the peak voltage on the pick-up coil coupler as follows.

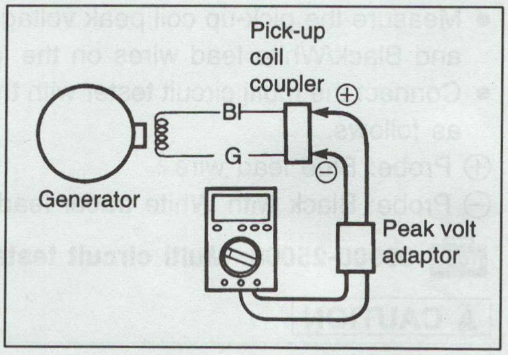


- Remove the front seat. (See p. 5-1.)
- Remove the fuel tank. (See p. 4-1.)
- Disconnect the pick-up coil coupler and connect the multi circuit tester with the peak volt adaptor.

⊕ Probe: Blue lead wire
⊖ Probe: Green lead wire

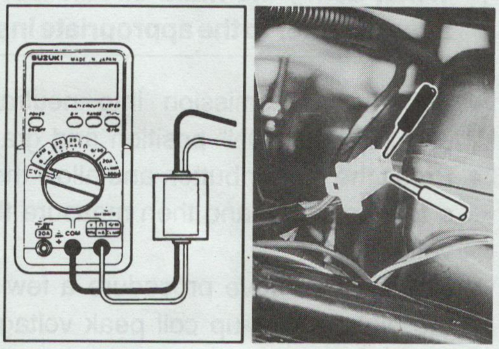
- Measure the pick-up coil peak voltage in the same manner as on the ignitor coupler.

Tester knob indication: Voltage (⎓)



Pick-up coil peak voltage:
More than 4.0 V (Blue–Green)

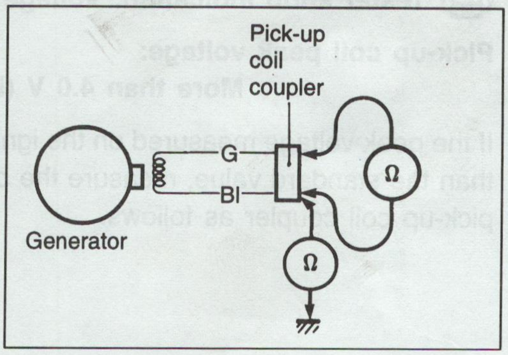
If the peak voltage on the pick-up coil lead wire couplers is ok but on the ignitor coupler is out of specification, the wire harness must be replaced. If both peak voltages are out of specification, the generator must be replaced and re-checked.



PICK-UP COIL RESISTANCE

- Remove the seat and fuel tank and disconnect the pick-up coil coupler.
- Measure the resistance between the lead wires and ground. If the resistance is not within the specified value, the generator stator must be replaced.

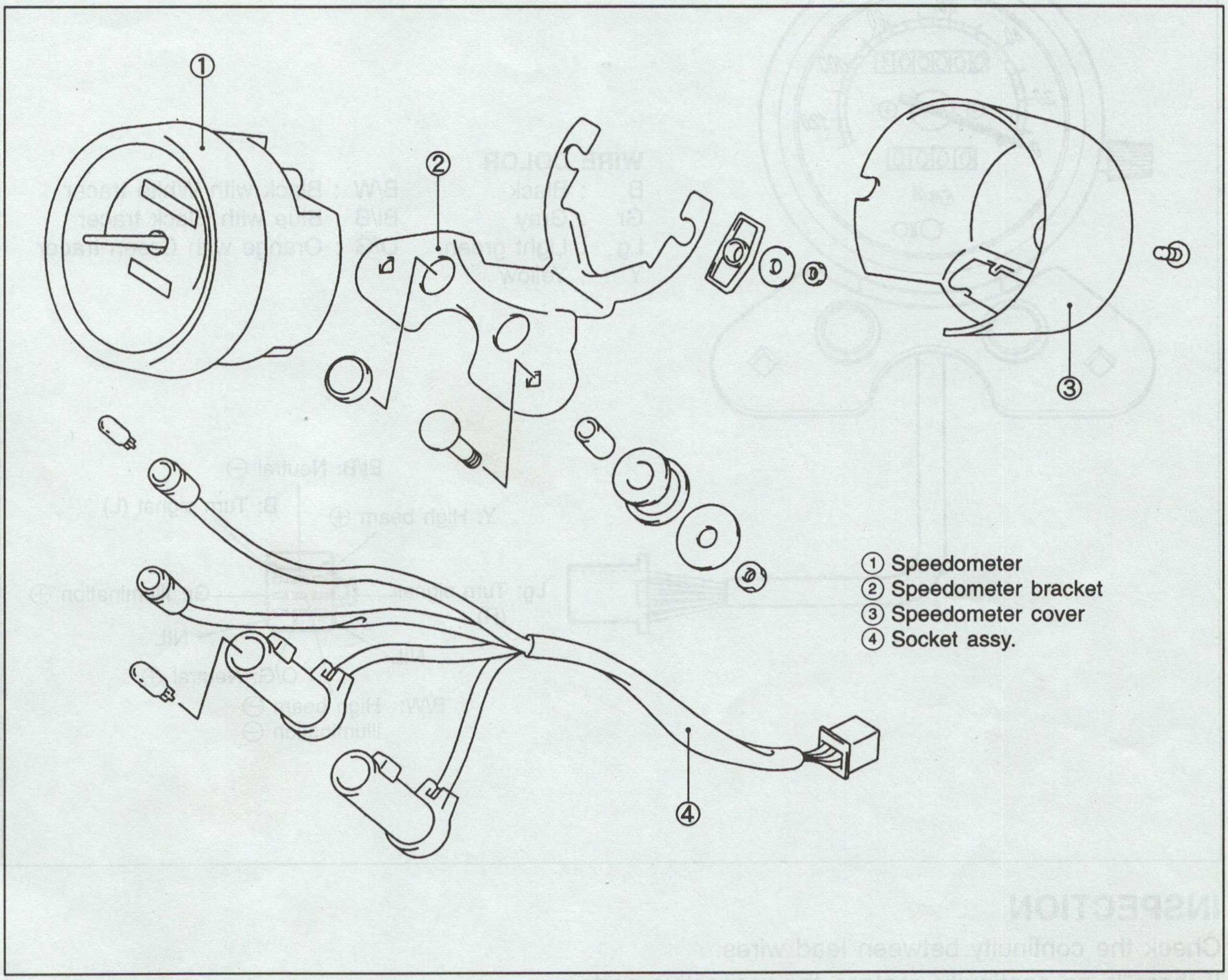
Pick-up coil resistance: 150–300 Ω (Blue–Green)
∞ Ω (Blue–Ground)



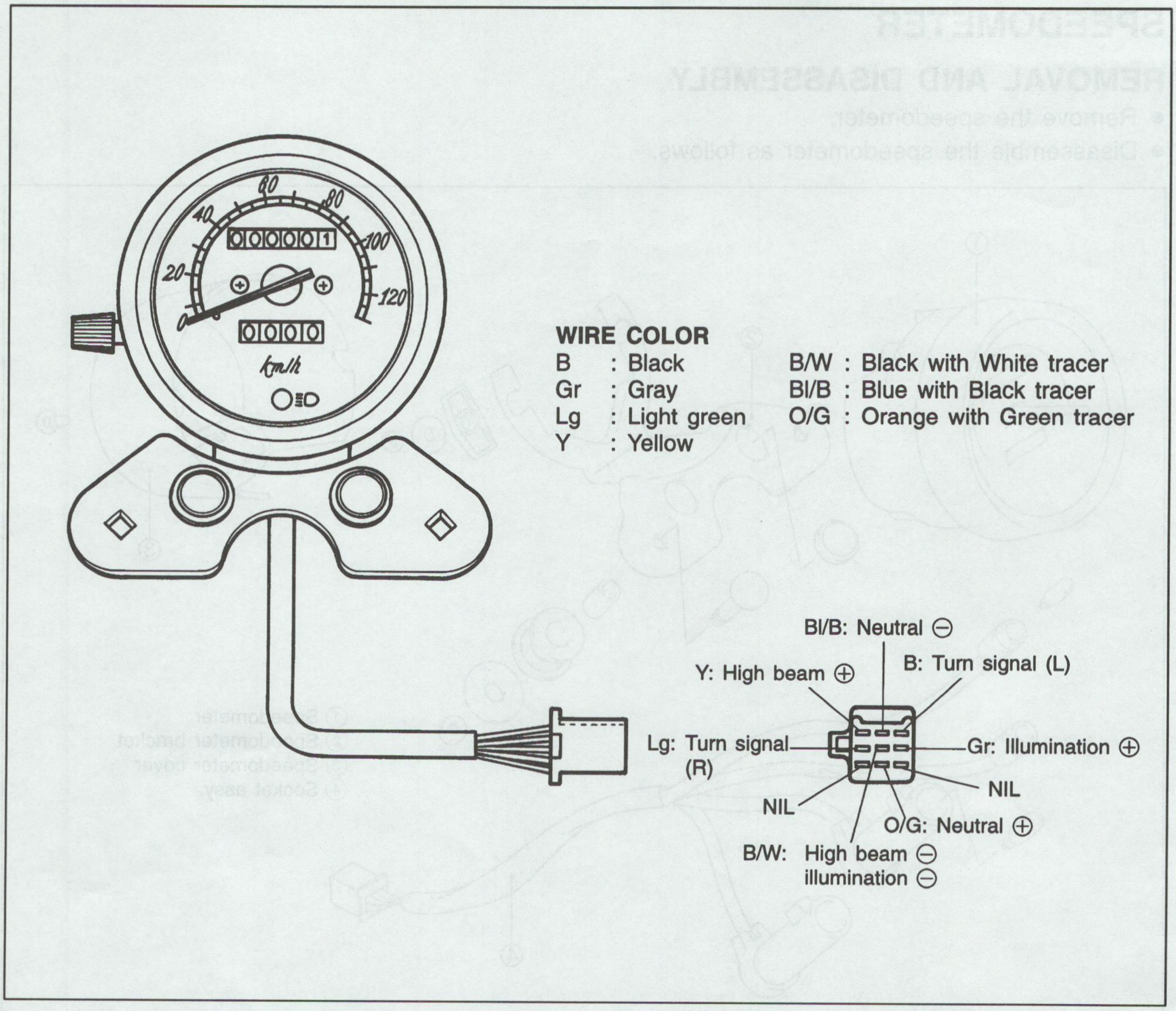
SPEEDOMETER

REMOVAL AND DISASSEMBLY

- Remove the speedometer.
- Disassemble the speedometer as follows.



① Speedometer
② Speedometer bracket
③ Speedometer cover
④ Socket assy.


0
20
40
60
80
100
120
km/h
Bl/B: Neutral ⊖
Y: High beam ⊕
B: Turn signal (L)
Lg: Turn signal (R)
Gr: Illumination ⊕
NIL
NIL
O/G: Neutral ⊕
B/W: High beam ⊖ illumination ⊖

WIRE COLOR

B	: Black	B/W	: Black with White tracer
Gr	: Gray	Bl/B	: Blue with Black tracer
Lg	: Light green	O/G	: Orange with Green tracer
Y	: Yellow		

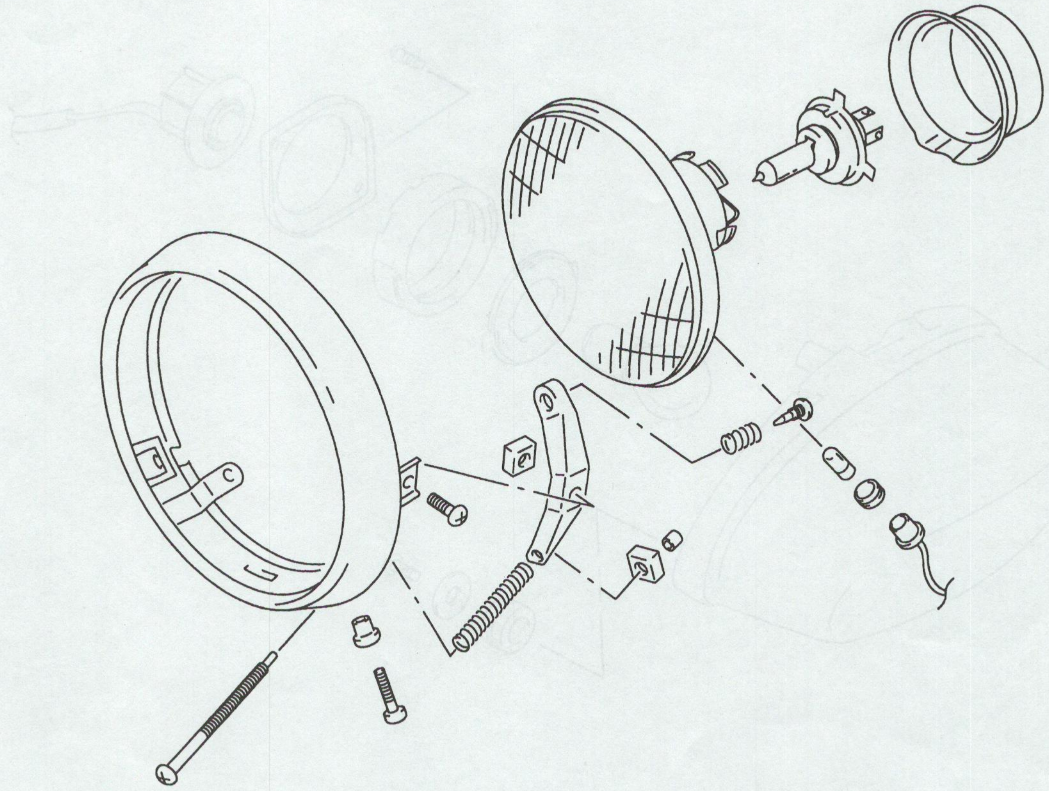
INSPECTION

Check the continuity between lead wires.
If there is no continuity, replace the respective parts.

NOTE:
When checking for continuity, it is not necessary to remove the speedometer.

LAMPS

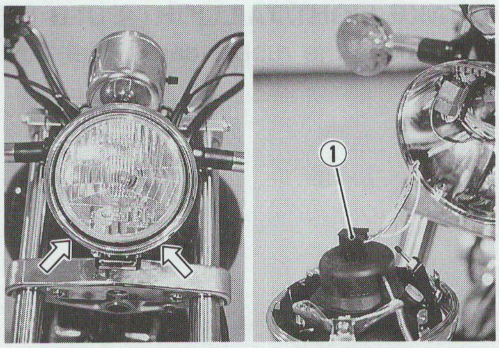
HEADLIGHT AND POSITION LIGHT



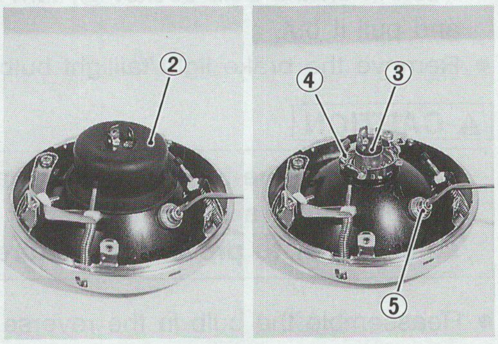
Headlight: 12V 60/55W
Position light: 12V 4W

HEADLIGHT BULB REPLACEMENT

- Remove the headlight.
- Disconnect the socket ①.



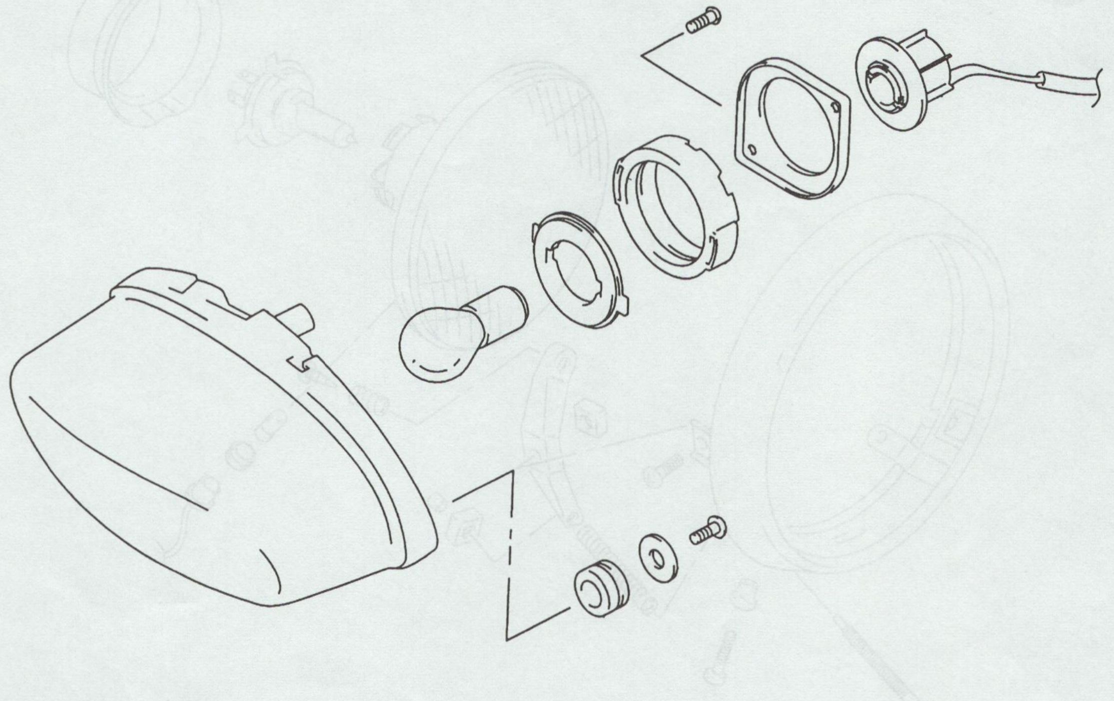
- Remove the rubber cap ②
- Remove the bulb ③ by removing the bulb holder spring ④.
- Remove the position light bulb ⑤.
- Reassemble the bulb in the reverse order of removal.



▲ CAUTION

If you touch the bulb with your bare hands, clean the bulb with a cloth moistened with alcohol or soapy water to prevent premature bulb failure.

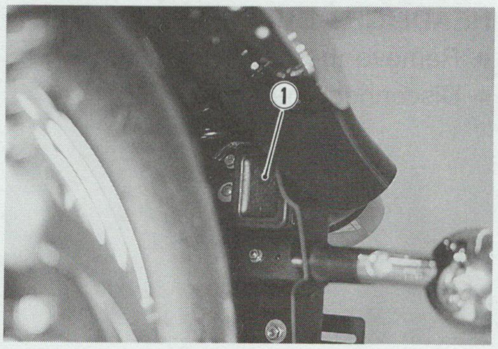
BRAKE LIGHT/TAILLIGHT



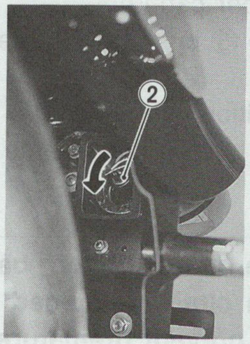
Brake light/Taillight: 12V 21/5W

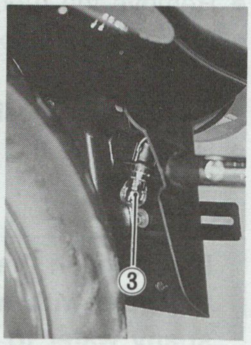
BRAKE LIGHT/TAILLIGHT BULB REPLACEMENT

- Remove the rubber cap ① behind the rear fender.



- Push in on the bulb socket ②, turn it counterclockwise, and pull it out.
- Remove the brake light/taillight bulb ③.



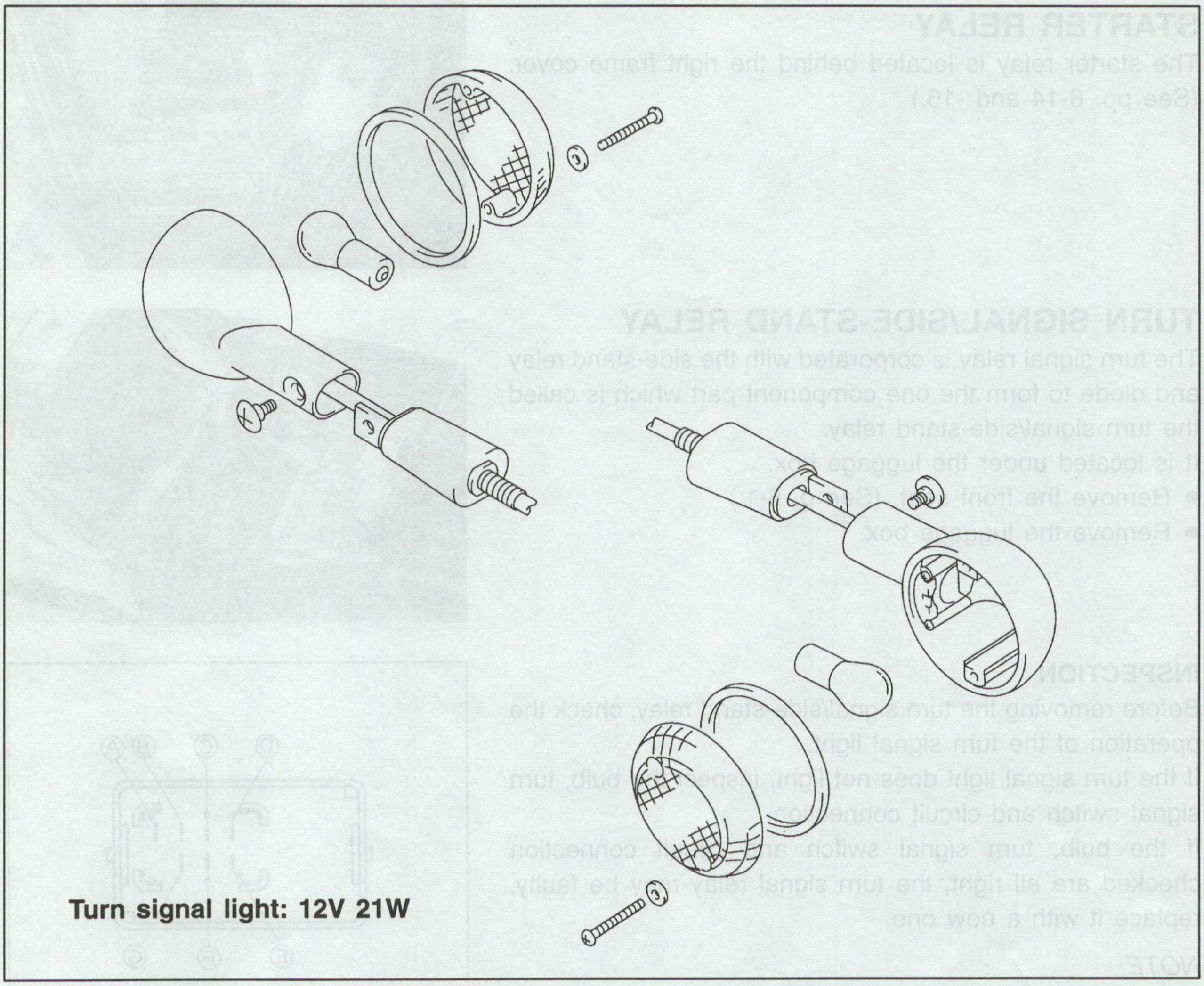


▲ CAUTION

If you touch the bulb with your bare hands, clean the bulb with a cloth moistened with alcohol or soapy water to prevent premature bulb failure.

- Reassemble the bulb in the reverse order of removal.

TURN SIGNAL LIGHTS



Turn signal light: 12V 21W

TURN SIGNAL LIGHT BULB REPLACEMENT

- Remove the lens by removing the screws.
- Remove the bulb.

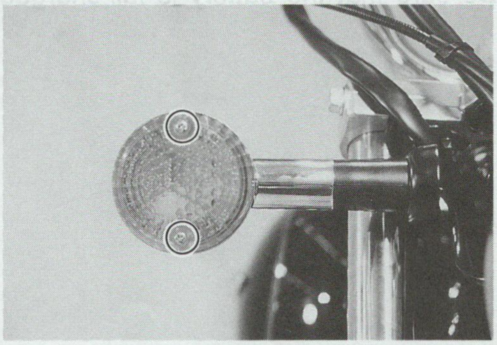
⚠ CAUTION

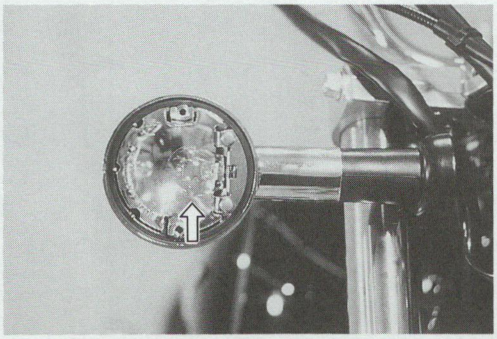
If you touch the bulb with your bare hands, clean the bulb with a cloth moistened with alcohol or soapy water to prevent premature bulb failure.

- Reassemble the bulb in the reverse order of removal.

⚠ CAUTION

Do not overtighten the lens fitting screws.

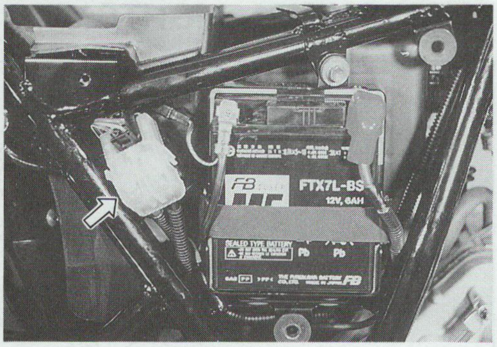




RELAYS

STARTER RELAY

The starter relay is located behind the right frame cover. (See pp. 6-14 and -15.)

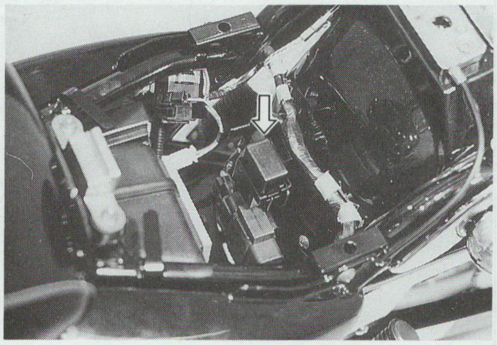


TURN SIGNAL/SIDE-STAND RELAY

The turn signal relay is corporated with the side-stand relay and diode to form the one component part which is called the turn signal/side-stand relay.

It is located under the luggage box.

- Remove the front seat. (See p. 5-1.)
- Remove the luggage box.



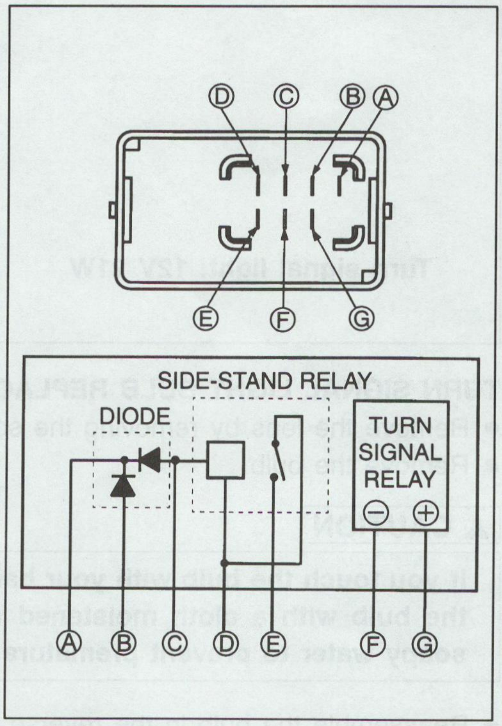
INSPECTION

Before removing the turn signal/side-stand relay, check the operation of the turn signal light.

If the turn signal light does not light, inspect the bulb, turn signal switch and circuit connection.

If the bulb, turn signal switch and circuit connection checked are all right, the turn signal relay may be faulty, replace it with a new one.

NOTE:
Be sure that the battery is full-charged.



SWITCHES

Measure each switch for continuity using a tester. If any abnormality is found, replace the respective switch assemblies with new ones.

IGNITION SWITCH

Position \ Color	R	O	O/Y	B/W	Gr	Br
ON	○—	—○	○—	—○	○—	—○
OFF						
LOCK						
P	○—	—	—	—	—	—○

LIGHTING SWITCH

Position \ Color	O/Bl	Gr	O/R	Y/W
OFF (●)				
(☼)	○—	—○		
ON (☀)	○—	—○	○—	—○

DIMMER SWITCH

Position \ Color	W	Y	Y/W
HI (≣D)		○—	—○
LO (⫽D)	○—	—	—○

TURN SIGNAL SWITCH

Position \ Color	Lg	Lbl	B
L (⇦)		○—	—○
PUSH			
R (⇨)	○—	—○	

ENGINE STOP SWITCH

Position \ Color	O/B	O/W
OFF (⊗)		
RUN (↻)	○—	—○

STARTER BUTTON

Position \ Color	O/W	Y/G
•		
PUSH	○—	—○

HORN BUTTON

Position \ Color	B/Bl	B/W
•		
PUSH	○—	—○

FRONT BRAKE LIGHT SWITCH

Position \ Color	B/R	B/Bl
OFF		
ON	○—	—○

REAR BRAKE LIGHT SWITCH

Position \ Color	O	W/B
OFF		
ON	○—	—○

CLUTCH LEVER POSITION SWITCH

Position \ Color	B/Y	B/Y
FREE		
•	○—	—○

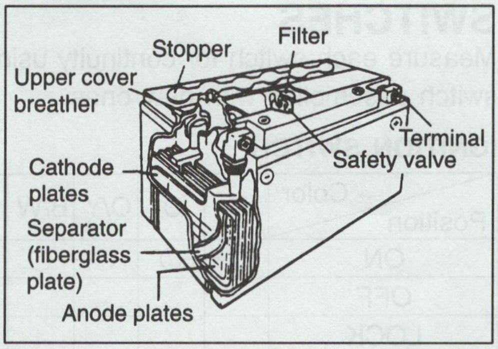
WIRE COLOR

B : Black
Br : Brown
Gr : Gray
Lbl : Light blue
Lg : Light green
O : Orange
R : Red
Y : Yellow
W : White
B/Bl : Black with Blue tracer
B/W : Black with White tracer
B/Y : Black with Yellow tracer
B/R : Black with Red tracer
O/B : Orange with Black tracer
O/Bl : Orange with Blue tracer
O/R : Orange with Red tracer
O/W : Orange with White tracer
O/Y : Orange with Yellow tracer
W/B : White with Black tracer
Y/W : Yellow with White tracer
Y/G : Yellow with Green tracer

BATTERY

SPECIFICATIONS

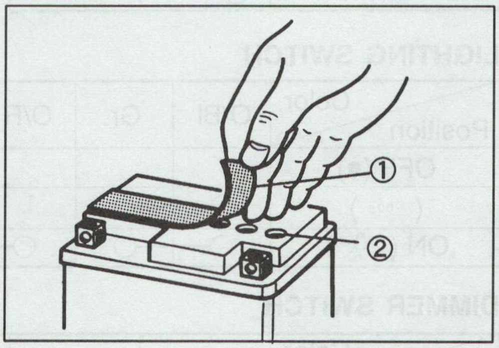
Type designation	FTX7L-BS
Capacity	12V, 21.6 kC (6 Ah)/10HR
Standard electrolyte S.G.	1.320 at 20°C (68°F)


Stopper
Filter
Upper cover breather
Terminal
Safety valve
Cathode plates
Separator (fiberglass plate)
Anode plates

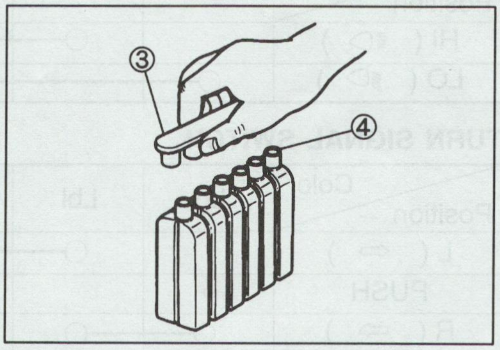
INITIAL CHARGING

FILLING ELECTROLYTE

- Remove the aluminum tape ① which seals the battery filler holes ②.



- Remove the caps ③ from the electrolyte container.

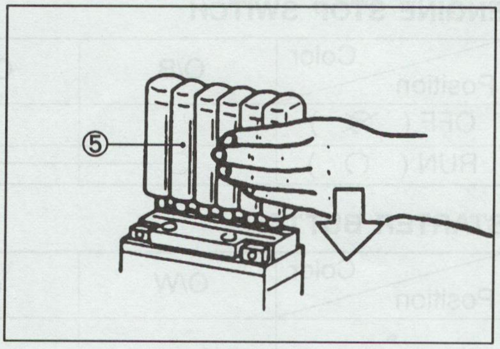


NOTE:

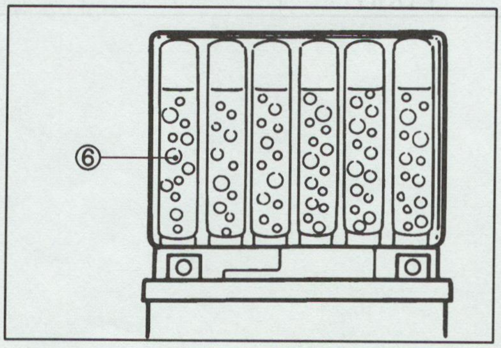
* *Do not remove or pierce the sealed areas ④ of the electrolyte container.*

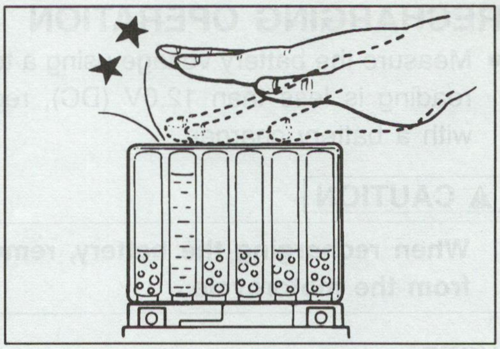
* *After completely filling the battery with electrolyte, use the caps ③ from the electrolyte container to seal the battery filler holes.*

- Insert the nozzles of the electrolyte container ⑤ into the battery's electrolyte filler holes. Hold the electrolyte container firmly so that it does not fall. Do not allow any of the electrolyte to spill.



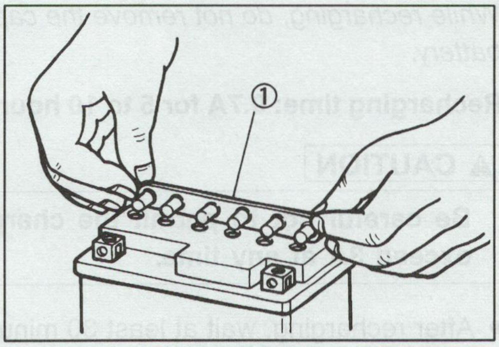
- Make sure that the air bubbles ⑥ rise to the top of each electrolyte container and leave the electrolyte container in this position for more than 20 minutes.





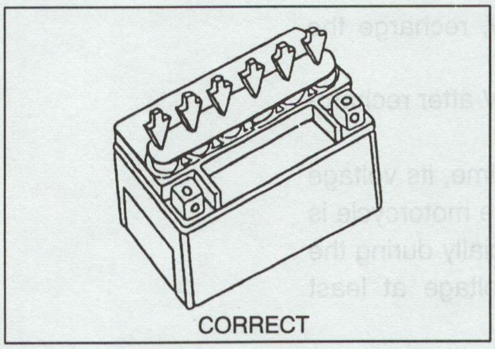
NOTE:
If air bubbles do not rise from any one of the filler ports, tap the bottom of the electrolyte container two or three times. Never remove the electrolyte container from the battery while there is still electrolyte in the container.

- After the electrolyte container is completely empty, remove it from the battery and wait about 20 minutes.
- Insert the caps ① firmly into the filler holes, so that the top of the caps do not protrude above the upper surface of the battery's top cover.

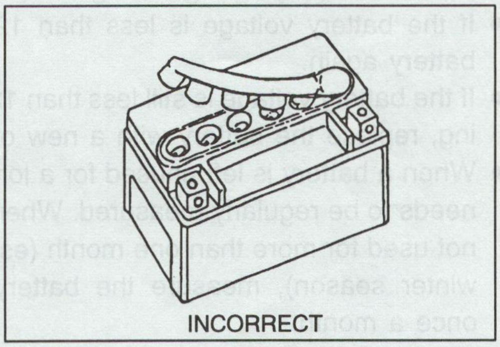


▲ CAUTION

- * **The charging system for a MF battery is different from that of a conventional battery. Only use the specified MF battery.**
- * **Do not remove the caps once they are installed in the battery**

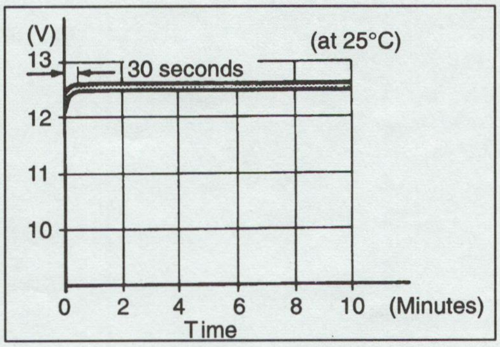


CORRECT



INCORRECT

- Measure the battery voltage using a tester. The tester should indicate more than 12.5–12.6V (DC), as shown. If the battery voltage is lower than specification, charge the battery with a battery charger.



NOTE:
Initial charging for a new battery is recommended if two years have elapsed since the date of manufacture.

SERVICING

Visually inspect the surface of the battery container. If any signs of cracking or electrolyte leakage from the sides of the battery have occurred, replace the battery with a new one. If the battery terminals are found to be coated with rust or an acidic white powdery substance, clean the battery terminals with sandpaper.

RECHARGING OPERATION

- Measure the battery voltage using a tester. If the voltage reading is less than 12.0V (DC), recharge the battery with a battery charger.

⚠ CAUTION

When recharging the battery, remove the battery from the motorcycle.

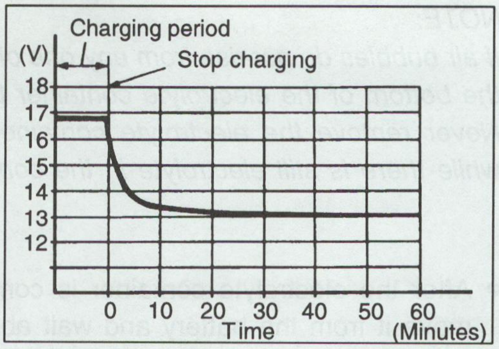
NOTE:
While recharging, do not remove the caps on the top of the battery.

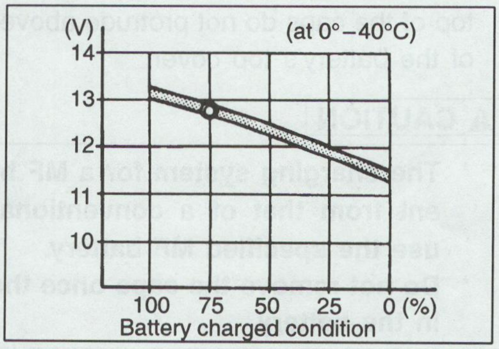
Recharging time: 0.7A for 5 to 10 hours or 3A for 1 hour

⚠ CAUTION

Be careful not to permit the charging current to exceed 3A at any time.

- After recharging, wait at least 30 minutes and then measure the battery voltage using a tester.
- If the battery voltage is less than 12.5V, recharge the battery again.
- If the battery voltage is still less than 12.5V after recharging, replace the battery with a new one.
- When a battery is left unused for a long time, its voltage needs to be regularly measured. When the motorcycle is not used for more than one month (especially during the winter season), measure the battery voltage at least once a month.





SERVICING INFORMATION

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TROUBLESHOOTING

ENGINE

Complaint	Symptom and possible causes	Remedy
Engine will not start, or is hard to start.	**Compression too low**	
	1. Worn cylinder.	Rebore or replace.
	2. Worn piston ring.	Replace.
	3. Worn valve guide or improper valve seating.	Repair or replace
	4. Loose spark plug.	Tighten.
	5. Broken, cracked or damaged piston	Replace
	6. Slow cranking starter motor.	See electrical section.
	7. Mistimed valves.	Adjust.
	8. Valve clearance out of adjustment.	Adjust.
	Spark plug not sparking	
	1. Damaged spark plug.	Replace.
	2. Damaged spark plug cap.	Replace.
	3. Fouled spark plug.	Clean or replace.
	4. Wet spark plug.	Clean and dry or replace.
	5. Defective ignition coil.	Replace.
	6. Open or short in high-tension cord.	Replace.
	7. Defective pick-up coil or ignitor unit.	Replace.
	No fuel reaching the carburetor	
	1. Clogged or defective fuel valve.	Clean or replace.
	2. Defective carburetor needle valve.	Replace with carburetor needle valve seat.
	3. Clogged fuel hose.	Clean or replace.
	4. Clogged fuel filter.	Clean or replace.
Engine stalls easily.	1. Fouled spark plug.	Clean or replace.
	2. Defective pick-up coil or ignitor unit.	Replace.
	3. Clogged fuel hose.	Clean.
	4. Clogged carburetor jet.	Clean.
	5. Valve clearance out of adjustment.	Adjust.

Complaint	Symptom and possible causes	Remedy
Engine is noisy. **Noisy engine.**	**Excessive valve chatter**	
	1. Excessive valve clearance.	Adjust.
	2. Weak or broken valve spring.	Replace.
	3. Worn cam surface.	Replace.
	4. Worn or burnt camshaft journal.	Replace camshaft.
	Noise seems to come from the piston	
	1. Worn piston.	Replace.
	2. Worn cylinder.	Rebore or replace.
	3. Carbon build-up in combustion chamber.	Clean.
	4. Worn piston pin or piston pin bore.	Replace.
	5. Worn piston ring or ring groove.	Replace.
	Noise seems to come from the cam chain	
	1. Stretched cam chain.	Replace cam chain and sprocket.
	2. Worn cam chain sprocket.	Replace cam chain and sprocket.
	3. Improperly working cam chain tension adjuster.	Repair or replace.
	Noise seems to come from the clutch	
	1. Worn countershaft spline.	Replace countershaft.
	2. Worn clutch hub spline.	Replace clutch hub.
	3. Worn clutch plate teeth.	Replace clutch plate.
	4. Distorted clutch plate.	Replace.
	5. Worn clutch release bearing.	Replace.
	6. Weak clutch damper.	Replace primary driven gear.
	7. Weak clutch spring.	Replace.
	Noise seems to come from the crankshaft	
	1. Rattling bearing.	Replace.
	2. Worn or burnt crank pin bearing.	Replace.
	3. Worn or burnt ball bearing.	Replace.
	Noise seems to come from the transmission	
	1. Worn or rubbing gear.	Replace.
	2. Worn countershaft spline.	Replace countershaft.
	3. Worn driveshaft spline.	Replace driveshaft.
	4. Worn or rubbing primary gear.	Replace.
	5. Worn bearing.	Replace.
Clutch slips.	1. Clutch cable out of adjustment.	Adjust.
	2. Weak or broken clutch spring.	Replace.
	3. Worn or distorted clutch pressure plate.	Replace.
	4. Distorted clutch plate.	Replace.
Clutch drags.	1. Clutch out of adjustment.	Adjust.
	2. Some clutch springs are weak, while others are not.	Replace.
	3. Worn or distorted clutch pressure plate.	Replace.
	4. Distorted clutch plate.	Replace.
Transmission will not shift.	1. Broken gearshift cam.	Replace.
	2. Distorted gearshift fork.	Replace.
	3. Worn gearshift pawl.	Replace.

Complaint	Symptom and possible causes	Remedy
Transmission will not shift back.	1. Broken gearshift shaft return spring.	Replace.
	2. Rubbing or stuck gearshift shaft.	Repair or replace.
	3. Worn or distorted gearshift fork.	Replace.
Transmission jumps out of gear.	1. Worn gear.	Replace.
	2. Worn or distorted gearshift fork.	Replace.
	3. Weakened gearshift cam stopper spring.	Replace.
	4. Worn gearshift pawl.	Replace.
Engine idles poorly.	1. Valve clearance out of adjustment.	Adjust.
	2. Improper valve seating.	Repair or replace.
	3. Worn valve guide.	Replace.
	4. Worn cam surface.	Replace.
	5. Excessive spark plug gap.	Adjust or replace.
	6. Defective ignition coil.	Replace.
	7. Defective pick-up coil or ignitor unit.	Replace.
	8. Spark plug too cold.	Replace by hot type plug.
	9. Incorrect float chamber fuel level.	Adjust float height.
	10. Clogged carburetor jet.	Clean.
	11. Defective generator.	Replace.
Engine runs poorly in high-speed range.	1. Weak valve spring.	Replace.
	2. Worn camshaft.	Replace.
	3. Insufficient spark plug gap.	Regap or replace.
	4. Mistimed valves.	Adjust.
	5. Ignition not advanced sufficiently due to poorly working timing advance circuit.	Replace ignitor unit.
	6. Defective ignition coil.	Replace.
	7. Defective pick-up coil or ignitor unit.	Replace.
	8. Low float chamber fuel level.	Adjust float height.
	9. Clogged air cleaner element.	Clean or replace.
	10. Clogged fuel hose, resulting in inadequate fuel supply to carburetor.	Clean and prime.
Exhaust smoke is dirty or thick.	1. Excessive amount of engine oil.	Check level and drain.
	2. Worn cylinder.	Rebore or replace.
	3. Worn piston ring.	Replace.
	4. Worn valve guide.	Replace.
	5. Scored or scuffed cylinder wall.	Rebore or replace.
	6. Worn valve stem.	Replace valve.
	7. Defective valve stem oil seal.	Replace.
	8. Worn oil ring side rail.	Replace oil ring.
Engine lacks power.	1. Insufficient valve clearance.	Adjust.
	2. Weak valve spring.	Replace.
	3. Mistimed valves.	Adjust.
	4. Worn cylinder.	Rebore or replace.
	5. Worn piston ring.	Replace.
	6. Improper valve seating.	Repair or replace.
	7. Fouled spark plug.	Clean or replace.
	8. Incorrect spark plug.	Replace.
	9. Clogged carburetor jet.	Clean.
	10. Incorrect float chamber fuel level.	Adjust float height.
	11. Clogged air cleaner element.	Clean or replace.
	12. Worn camshaft.	Replace.
	13. Air leaked from intake pipe.	Tighten or replace.
	14. Excessive amount of engine oil.	Check level and drain.

Complaint	Symptom and possible causes	Remedy
Engine overheats.	1. Heavy carbon deposit on piston crown.	Clean.
	2. Not enough oil in the engine.	Add oil.
	3. Defective oil pump or clogged oil circuit.	Replace or clean.
	4. Too low in float chambers fuel level.	Adjust.
	5. Sucking air from intake pipe.	Retighten or replace.
	6. Use incorrect engine oil.	Change.
	7. Clogged air intake with dust.	Clean.

CARBURETOR

Complaint	Symptom and possible causes	Remedy
Starting difficulty.	1. Clogged fuel pipe.	Clean.
	2. Air leaking from joint between starter body and carburetor.	Tighten, adjust or replace gasket.
	3. Air leaking from carburetor joint	Tighten or replace defective parts.
	4. Improperly working starter plunger.	Adjust.
Idling or low-speed trouble.	1. Clogged or loose pilot jet.	Clean or tighten.
	2. Air leaking from carburetor joint	Tighten or replace defective part.
	3. Clogged pilot outlet port.	Clean.
	4. Clogged bypass port.	Clean.
	5. Starter plunger not fully closed.	Adjust.
Medium-or high speed trouble.	1. Clogged main jet.	Clean.
	2. Clogged needle jet.	Clean.
	3. Improperly working throttle valve.	Adjust.
	4. Clogged fuel filter.	Clean or replace.
Overflow and fuel level fluctuations.	1. Worn or damaged needle valve.	Replace.
	2. Broken needle valve spring.	Replace.
	3. Improperly working float.	Adjust or replace.
	4. Foreign matter on the needle valve.	Clean or replace with needle valve seat.
	5. Incorrect float chamber fuel level.	Adjust float height.

CHASSIS

Complaint	Symptom and possible causes	Remedy
Steering is heavy.	1. Overtightened steering stem nut.	Adjust.
	2. Broken bearing/race in steering stem.	Replace.
	3. Distorted steering stem.	Replace.
	4. Low tire pressure.	Regulate.
Handlebars wobbles.	1. Loss of balance between right and left front fork legs.	Adjust or replace.
	2. Distorted front fork.	Repair or replace.
	3. Distorted front axle.	Replace.
	4. Twisted tire.	Replace.

Complaint	Symptom and possible causes	Remedy
Front wheel wobbles.	1. Distorted wheel rim. 2. Worn front wheel bearing. 3. Defective or incorrect tire. 4. Loose front axle. 5. Incorrect front fork oil level. 6. Loose wheel spoke.	Replace. Replace. Replace. Tighten. Adjust. Tighten.
Front suspension too soft.	1. Weak spring. 2. Insufficient fork oil.	Replace. Check level and add.
Front suspension too stiff.	1. Excessively viscous fork oil. 2. Excessive fork oil.	Replace. Check level and drain.
Front suspension too noisy.	1. Insufficient fork oil. 2. Loose front suspension fastener.	Check level and add. Tighten.
Rear wheel wobbles.	1. Distorted wheel rim. 2. Worn rear wheel bearing. 3. Defective or incorrect tire. 4. Worn swingarm bearing. 5. Loose rear axle nut or swingarm pivot nut. 6. Loosen wheel spokes. 7. Loosen rear suspension fastener.	Replace. Replace. Replace. Replace. Tighten. Tighten. Tighten.
Rear suspension too soft.	1. Weak rear shock absorber spring. 2. Rear shock absorber leaks oil. 3. Improper suspension setting.	Replace. Replace. Adjust.
Rear suspension too stiff.	1. Improperly adjusted rear suspension. 2. Bent swingarm. 3. Worn swingarm and rear suspension related bearings.	Adjust. Replace. Replace.
Rear suspension too noisy.	1. Loose rear suspension fastener. 2. Worn swingarm bearing.	Tighten. Replace.

BRAKES

Complaint	Symptom and possible causes	Remedy
Brake power insufficient.	1. Leakage of brake fluid. 2. Worn brake pad. 3. Oil in brake pad surface. 4. Worn brake disc. 5. Air in hydraulic system. 6. Worn brake shoe. 7. Oil in brake shoe surfaces. 8. Excessively worn brake drum. 9. Excessive brake pedal play.	Repair or replace. Replace. Clean brake disc and brake pads. Replace. Bleed. Replace. Clean. Replace. Adjust.

Complaint	Symptom and possible causes	Remedy
Brake squeaks.	1. Carbon adhesion on brake pad surface.	Clean surface with sandpaper.
	2. Tilted brake pad.	Readjust brake pad position or replace.
	3. Damaged wheel bearing.	Replace.
	4. Worn brake pad.	Replace.
	5. Foreign material in brake fluid.	Change brake fluid.
	6. Clogged return port of master cylinder.	Disassemble and clean master cylinder.
	7. Brake shoe surface glazed.	Clean surface with sandpaper.
	8. Worn brake shoe.	Replace.
	9. Loose front axle or rear axle nut.	Tighten.
Brake lever or pedal stroke excessive.	1. Air in hydraulic system.	Bleed.
	2. Insufficient brake fluid.	Check level and add. Bleed any air.
	3. Incorrect brake fluid.	Change.
	4. Worn brake camshaft.	Replace.
	5. Excessively worn brake shoes and/or brake drum.	Replace.
Brake fluid leaks.	1. Loose connection joint.	Tighten.
	2. Cracked brake hose.	Replace.
	3. Worn piston seal.	Replace

ELECTRICAL

Complaint	Symptom and possible causes	Remedy
No sparking or poor sparking.	1. Defective ignition coil.	Replace.
	2. Defective spark plug.	Replace.
	3. Defective pick-up coil.	Replace.
	1. Defective ignitor unit.	Replace.
Spark plug is wet or quickly becomes fouled with carbon.	1. Excessively rich air/fuel mixture.	Adjust carburetor
	2. Excessively high idling speed.	Adjust carburetor
	3. Incorrect gasoline.	Change.
	4. Clogged air cleaner element.	Clean or replace.
	5. Incorrect spark plug (cold type).	Change to hot type spark plug.
Spark plug quickly becomes fouled with oil or carbon.	1. Worn piston ring.	Replace.
	2. Worn piston.	Replace.
	3. Worn cylinder.	Rebore or replace.
	4. Excessive valve-stem-to-valve-guide clearance.	Replace.
	5. Worn valve stem oil seal.	Replace.
Spark plug electrodes overheat or burn.	1. Incorrect spark plug (hot type).	Change to cold type spark plug.
	2. Overheated engine.	Tune-up.
	3. Loose spark plug.	Tighten.
	4. Excessively lean air/fuel mixture.	Adjust carburetor.
Generator does not charge.	1. Open or short in lead wires, or loose lead connections.	Repair, replace or connect properly.
	2. Shorted, grounded or open stator coil.	Replace.
	3. Shorted or panctured regulator/rectifier.	Replace.

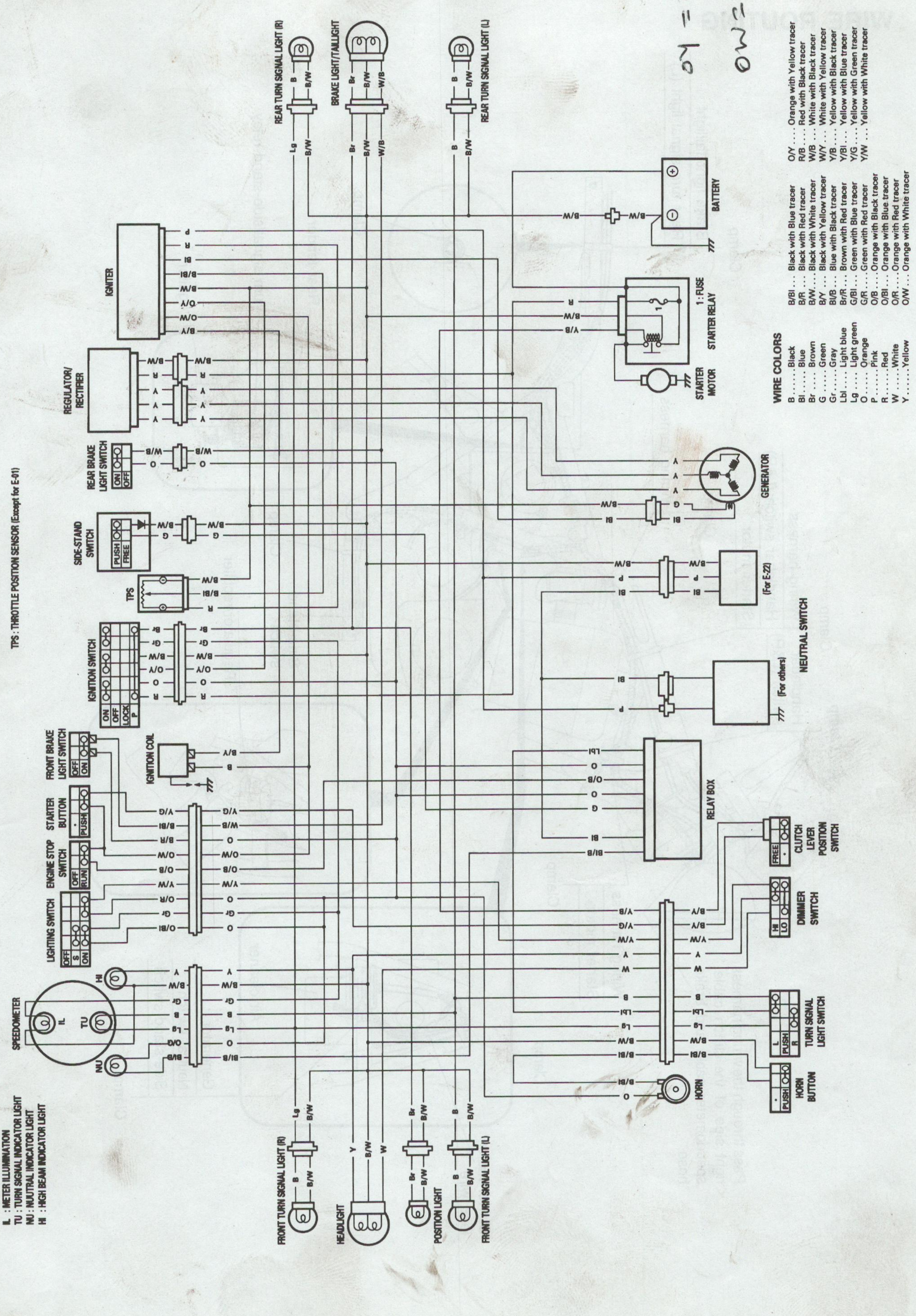
Complaint	Symptom and possible causes	Remedy
Generator charges but charging rate is below the specification.	1. Lead wires tend to get shorted or open-circuited or loosely connected at terminal.	Repair or tighten.
	2. Grounded or open-circuited stator coils or generator.	Replace.
	3. Defective regulator/rectifier.	Replace.
	4. Defective battery cell plates.	Replace battery.
Generator overcharges.	1. Internal short-circuit in the battery.	Replace battery.
	2. Damaged or defective regulator/rectifier.	Replace.
	3. Poorly grounded regulator/rectifier.	Clean, repair or replace.
Unstable charging.	1. Lead wire insulation frayed due to vibration, resulting in intermittent shorting.	Repair or replace.
	2. Internally shorted generator.	Replace.
	3. Defective regulator/rectifier.	Replace.
Starter button does not work.	1. Run down battery.	Recharge or replace.
	2. Defective switch contact.	Replace.
	3. Brushes do not seat properly on the commutator in the starter motor.	Repair or replace.
	4. Defective starter relay.	Replace.

BATTERY

Complaint	Symptom and possible causes	Remedy
Sulfation or spots on surfaces of cell plates.	1. Cracked battery case.	Replace battery.
	2. Battery has been left in a run-down condition for a long time.	Replace.
Battery runs down quickly.	1. Incorrect charging method.	Check generator or regulator/rectifier circuit connections, and make necessary adjustment to obtain specified charging operation.
	2. Battery cell plates have lost much of their active material as a result of overcharging.	Replace battery and correct charging system.
	3. Internally shorted battery.	Replace.
	4. Excessively low battery voltage.	Recharge
	5. Battery is too old.	Replace.
Battery sulfation.	1. Incorrect charging rate. (When not in use, the battery should be checked at least once a month and properly charged if necessary, to avoid sulfation.)	Replace battery.
	2. The battery was left unused in a cold climate for too long.	Replace battery if badly sulfated.

WIRING DIAGRAM

04 = 12
OW2


REAR TURN SIGNAL LIGHT (R)
BRAKE LIGHT/TAILLIGHT
REAR TURN SIGNAL LIGHT (L)
BATTERY
1 : FUSE
STARTER RELAY
STARTER MOTOR
GENERATOR
(For E-22)
NEUTRAL SWITCH
(For others)
RELAY BOX
CLUTCH LEVER POSITION SWITCH
DIMMER SWITCH
HI
LO
TURN SIGNAL LIGHT SWITCH
HORN BUTTON
PUSH
HORN
FRONT TURN SIGNAL LIGHT (L)
POSITION LIGHT
HEADLIGHT
FRONT TURN SIGNAL LIGHT (R)
SPEEDOMETER
IL
TU
NU
HI
LIGHTING SWITCH
ENGINE STOP SWITCH
OFF
RUN
STARTER BUTTON
FRONT BRAKE LIGHT SWITCH
IGNITION COIL
IGNITION SWITCH
ON
OFF
LOCK
P
TPS
SIDE-STAND SWITCH
FREE
REAR BRAKE LIGHT SWITCH
REGULATOR/ RECTIFIER
IGNITER

IL : METER ILLUMINATION
TU : TURN SIGNAL INDICATOR LIGHT
NU : NUUTRAL INDICATOR LIGHT
HI : HIGH BEAM INDICATOR LIGHT

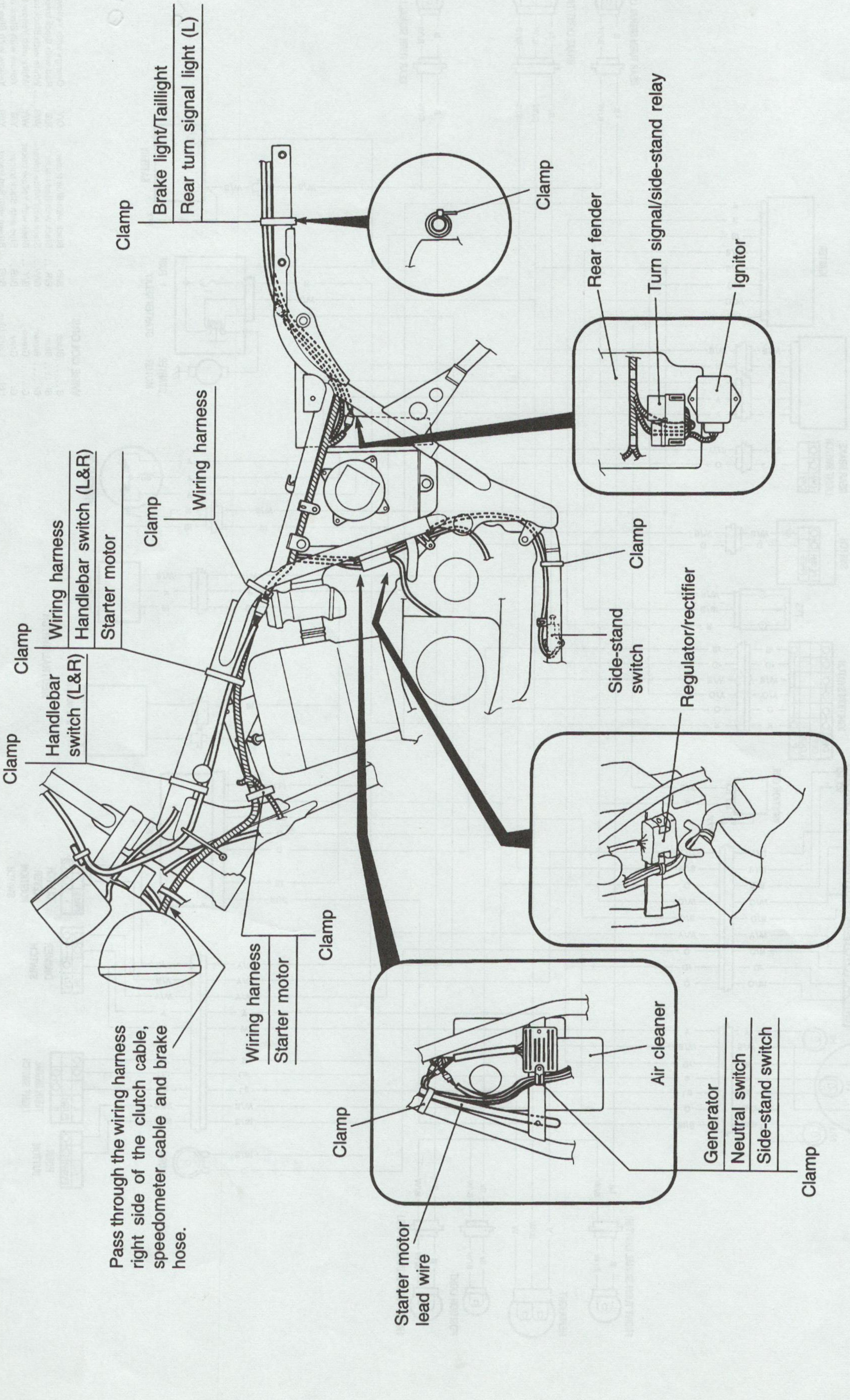
TPS : THROTTLE POSITION SENSOR (Except for E-01)

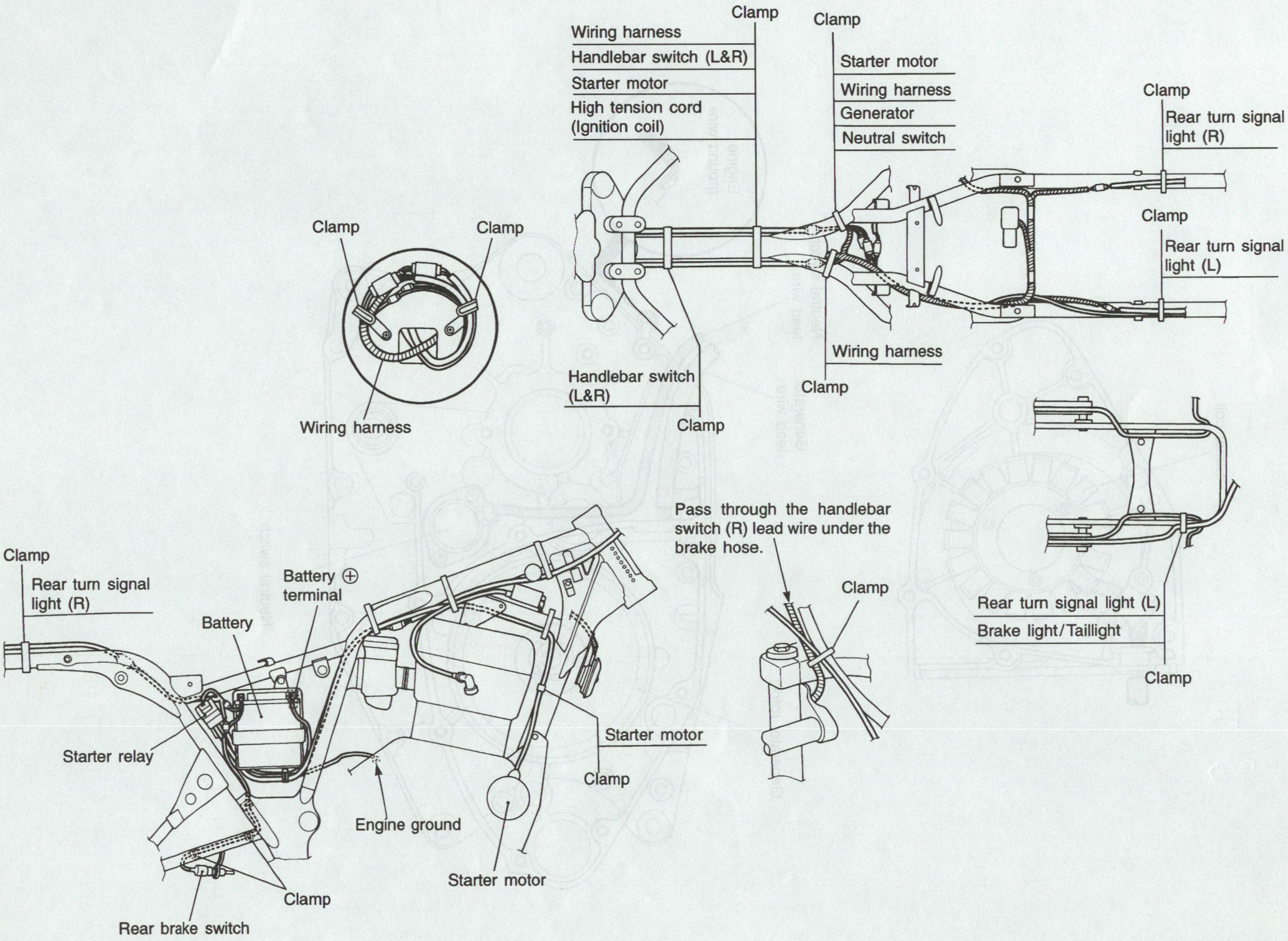
WIRE COLORS

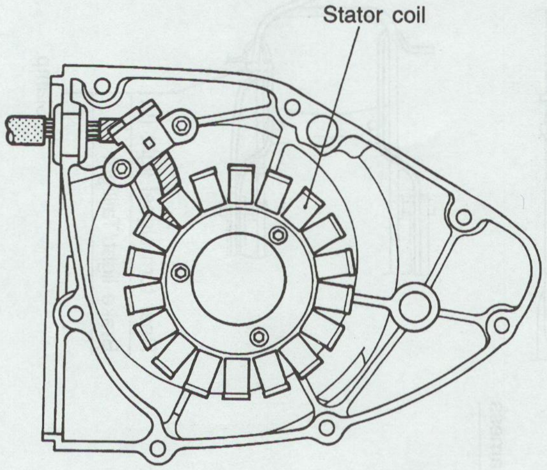
B	Black	B/Bl	Black with Blue tracer	O/Y	Orange with Yellow tracer
Bl	Blue	B/R	Black with Red tracer	R/B	Red with Black tracer
Br	Brown	B/W	Black with White tracer	W/B	White with Black tracer
G	Green	B/Y	Black with Yellow tracer	W/Y	White with Yellow tracer
Gr	Gray	Bl/B	Blue with Black tracer	Y/B	Yellow with Black tracer
Lbl	Light blue	Br/R	Brown with Red tracer	Y/Bl	Yellow with Blue tracer
Lg	Light green	G/Bl	Green with Blue tracer	Y/G	Yellow with Green tracer
O	Orange	G/R	Green with Red tracer	Y/W	Yellow with White tracer
P	Pink	O/B	Orange with Black tracer		
R	Red	O/Bl	Orange with Blue tracer		
W	White	O/R	Orange with Red tracer		
Y	Yellow	O/W	Orange with White tracer		

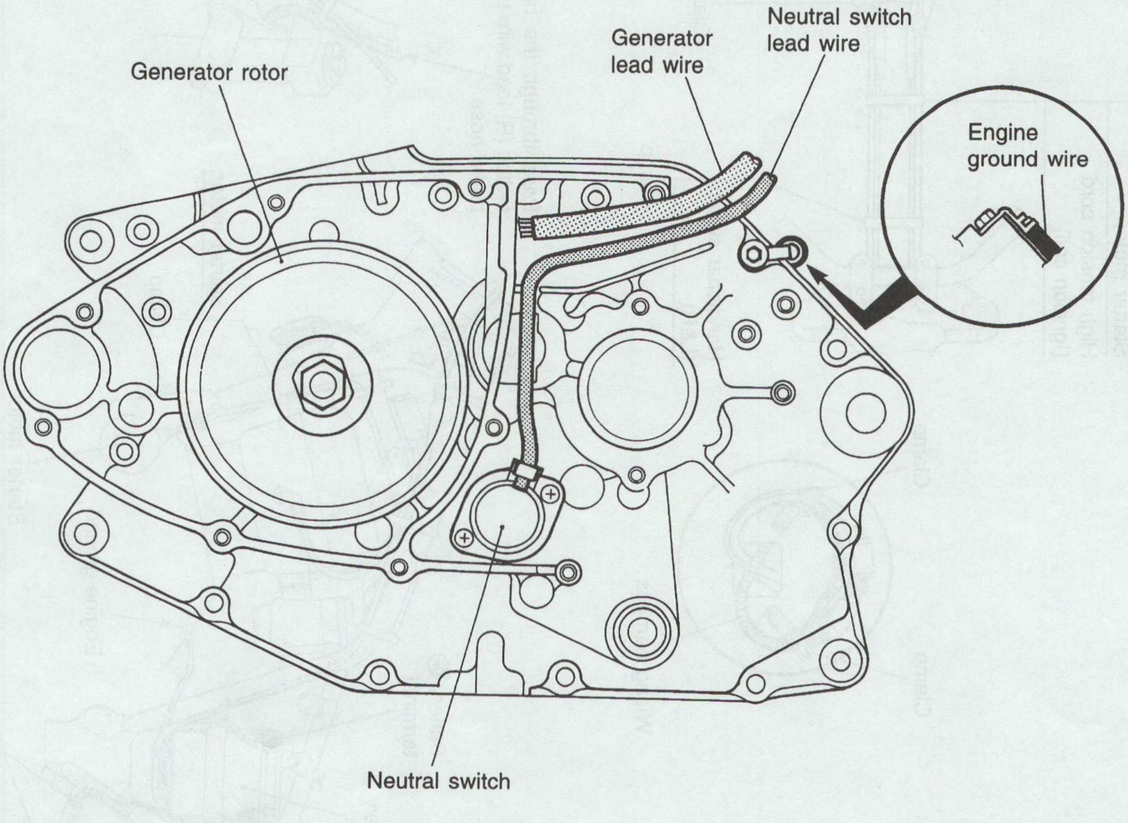
WIRE, CABLE AND HOSE ROUTING

WIRE ROUTING

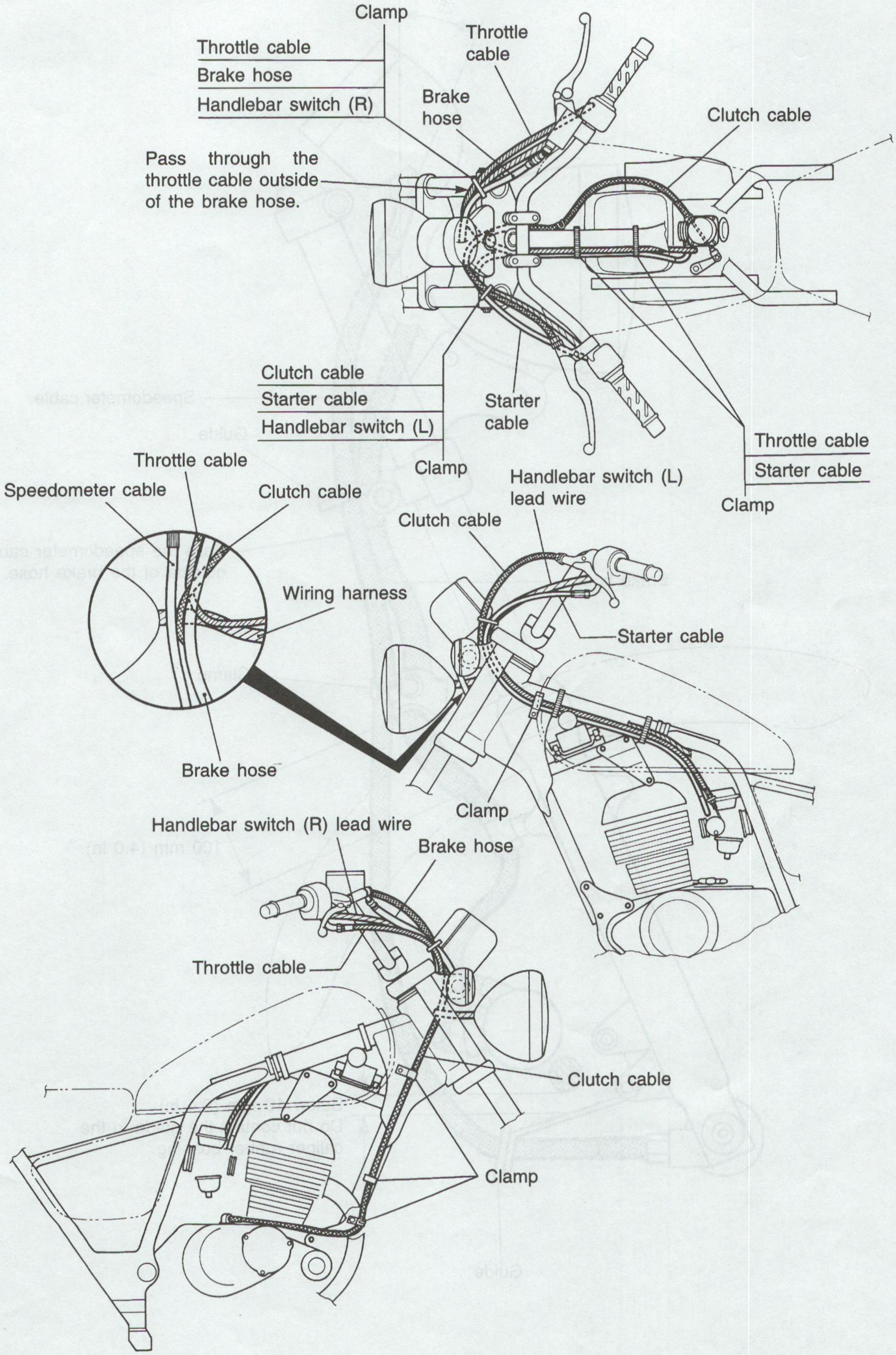

Brake light/Taillight
Rear turn signal light (L)
Clamp
Clamp
Rear fender
Turn signal/side-stand relay
Ignitor
Wiring harness
Clamp
Wiring harness
Handlebar switch (L&R)
Starter motor
Clamp
Clamp
Handlebar switch (L&R)
Clamp
Side-stand switch
Regulator/rectifier
Wiring harness
Starter motor
Clamp
Pass through the wiring harness right side of the clutch cable, speedometer cable and brake hose.
Clamp
Air cleaner
Generator
Neutral switch
Side-stand switch
Clamp
Starter motor lead wire

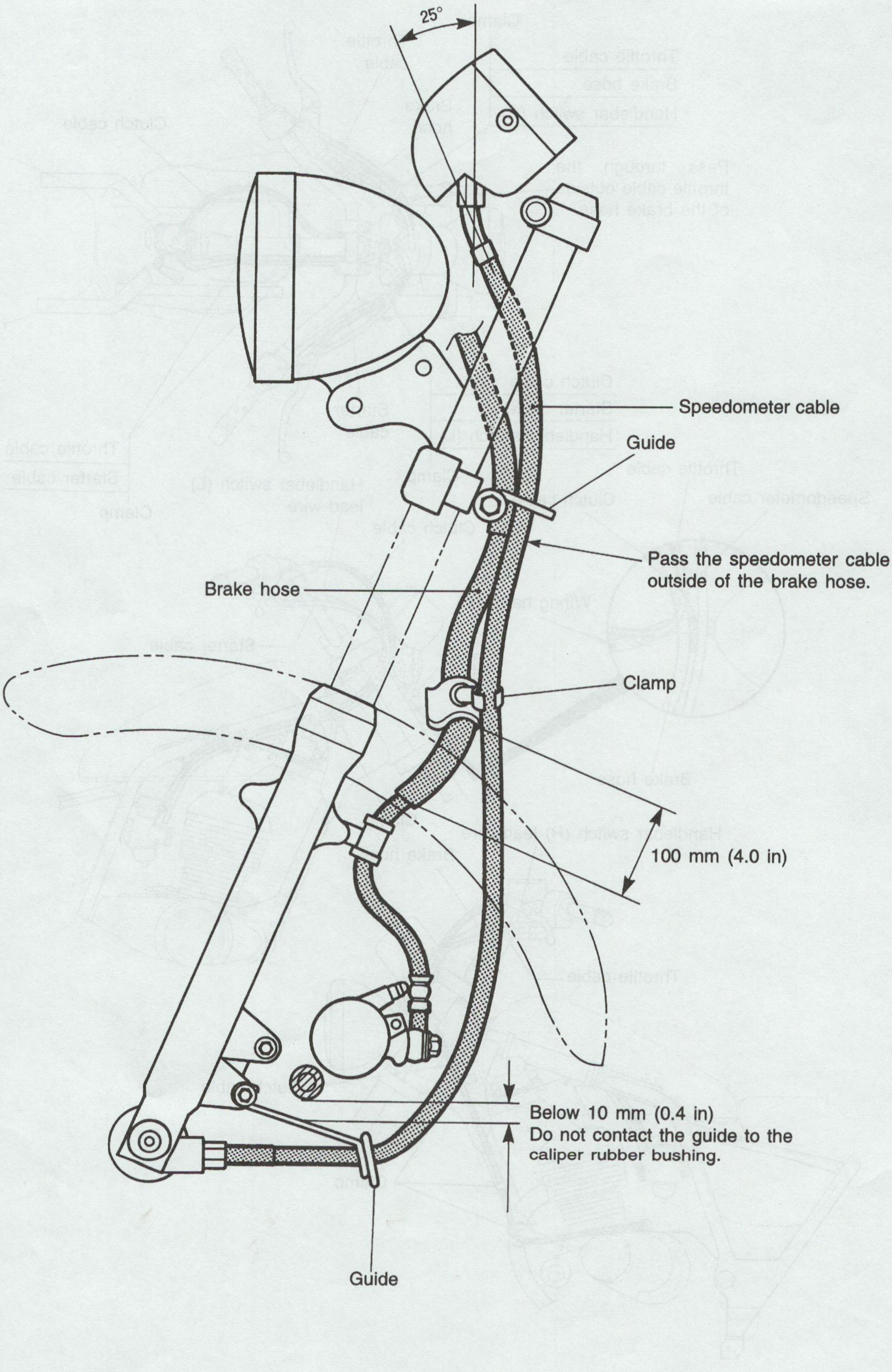

Clamp
Wiring harness
Handlebar switch (L&R)
Starter motor
High tension cord (Ignition coil)
Clamp
Starter motor
Wiring harness
Generator
Neutral switch
Clamp
Rear turn signal light (R)
Clamp
Rear turn signal light (L)
Wiring harness
Clamp
Handlebar switch (L&R)
Clamp
Clamp
Clamp
Wiring harness
Pass through the handlebar switch (R) lead wire under the brake hose.
Clamp
Rear turn signal light (L)
Brake light/Taillight
Clamp
Clamp
Rear turn signal light (R)
Battery ⊕ terminal
Battery
Starter relay
Engine ground
Starter motor
Clamp
Starter motor
Clamp
Rear brake switch

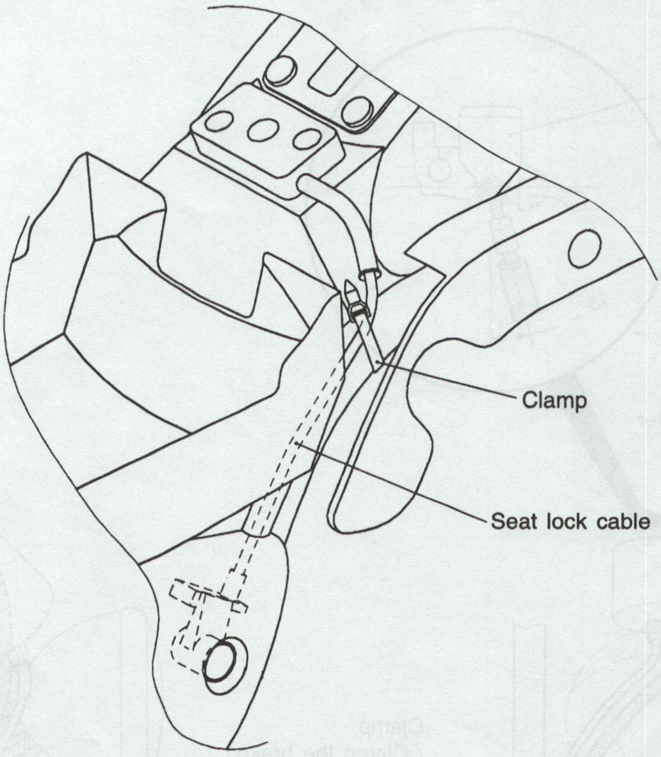

Stator coil

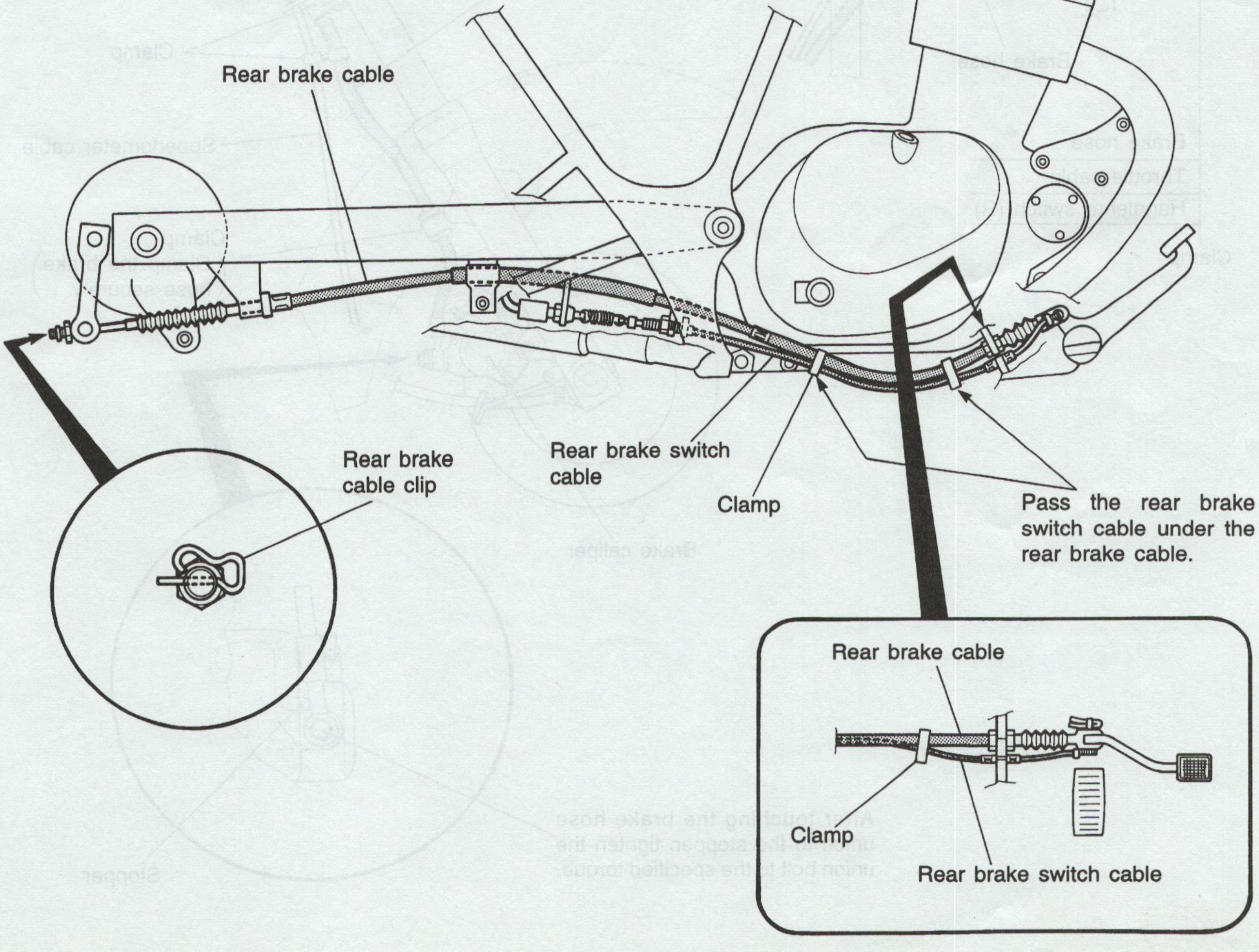

Generator rotor
Generator lead wire
Neutral switch lead wire
Engine ground wire
Neutral switch

CABLE ROUTING


Clamp
Throttle cable
Brake hose
Handlebar switch (R)
Throttle cable
Brake hose
Clutch cable
Pass through the throttle cable outside of the brake hose.
Clutch cable
Starter cable
Handlebar switch (L)
Starter cable
Clamp
Throttle cable
Starter cable
Clamp
Throttle cable
Speedometer cable
Clutch cable
Handlebar switch (L) lead wire
Clutch cable
Wiring harness
Starter cable
Brake hose
Clamp
Handlebar switch (R) lead wire
Brake hose
Throttle cable
Clutch cable
Clamp

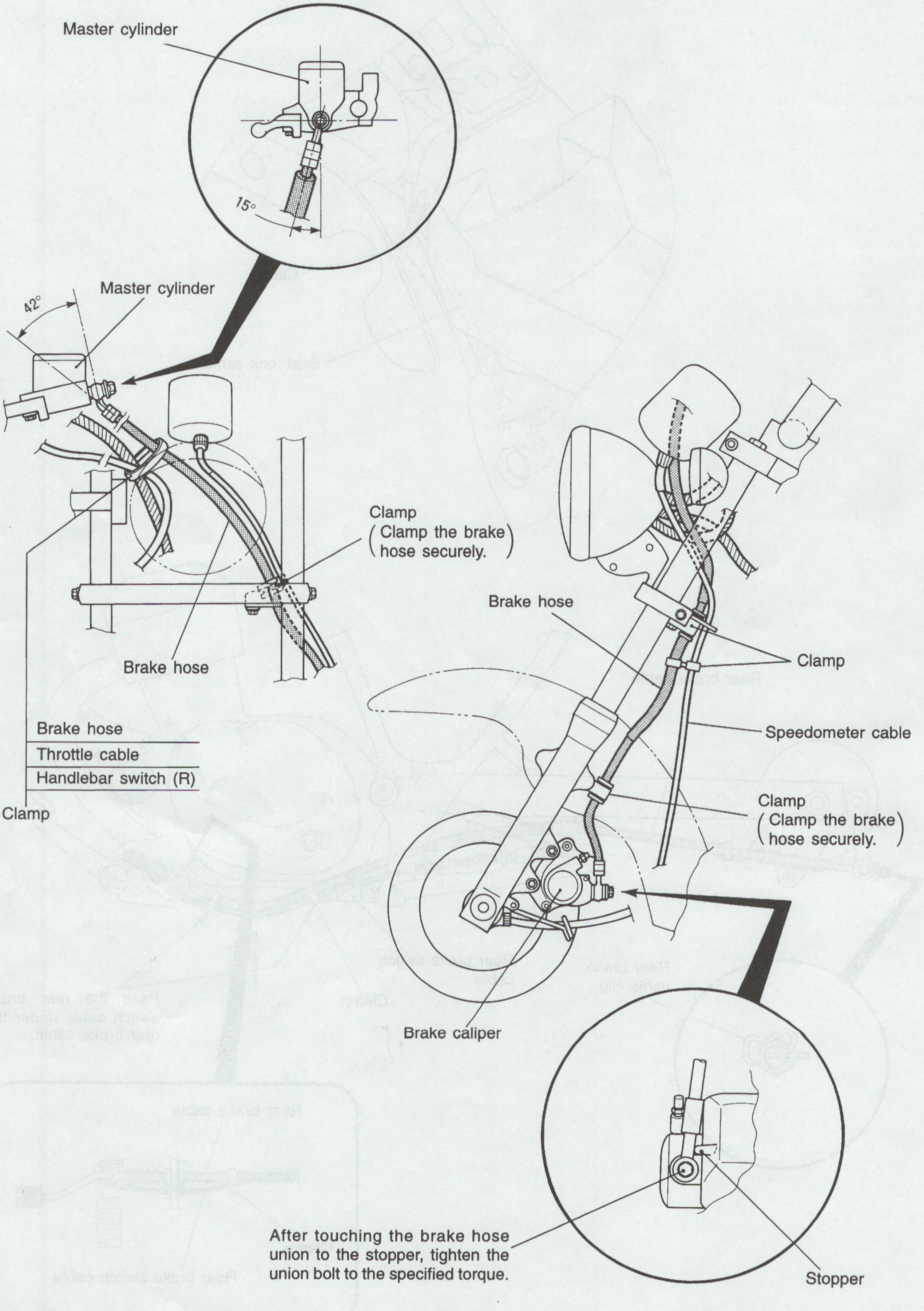

25°
Speedometer cable
Guide
Pass the speedometer cable outside of the brake hose.
Brake hose
Clamp
100 mm (4.0 in)
Below 10 mm (0.4 in)
Do not contact the guide to the caliper rubber bushing.
Guide


Clamp
Seat lock cable

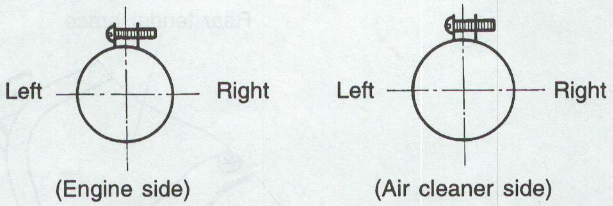

Rear brake cable
Rear brake cable clip
Rear brake switch cable
Clamp
Rear brake cable
Clamp
Rear brake switch cable

Pass the rear brake switch cable under the rear brake cable.

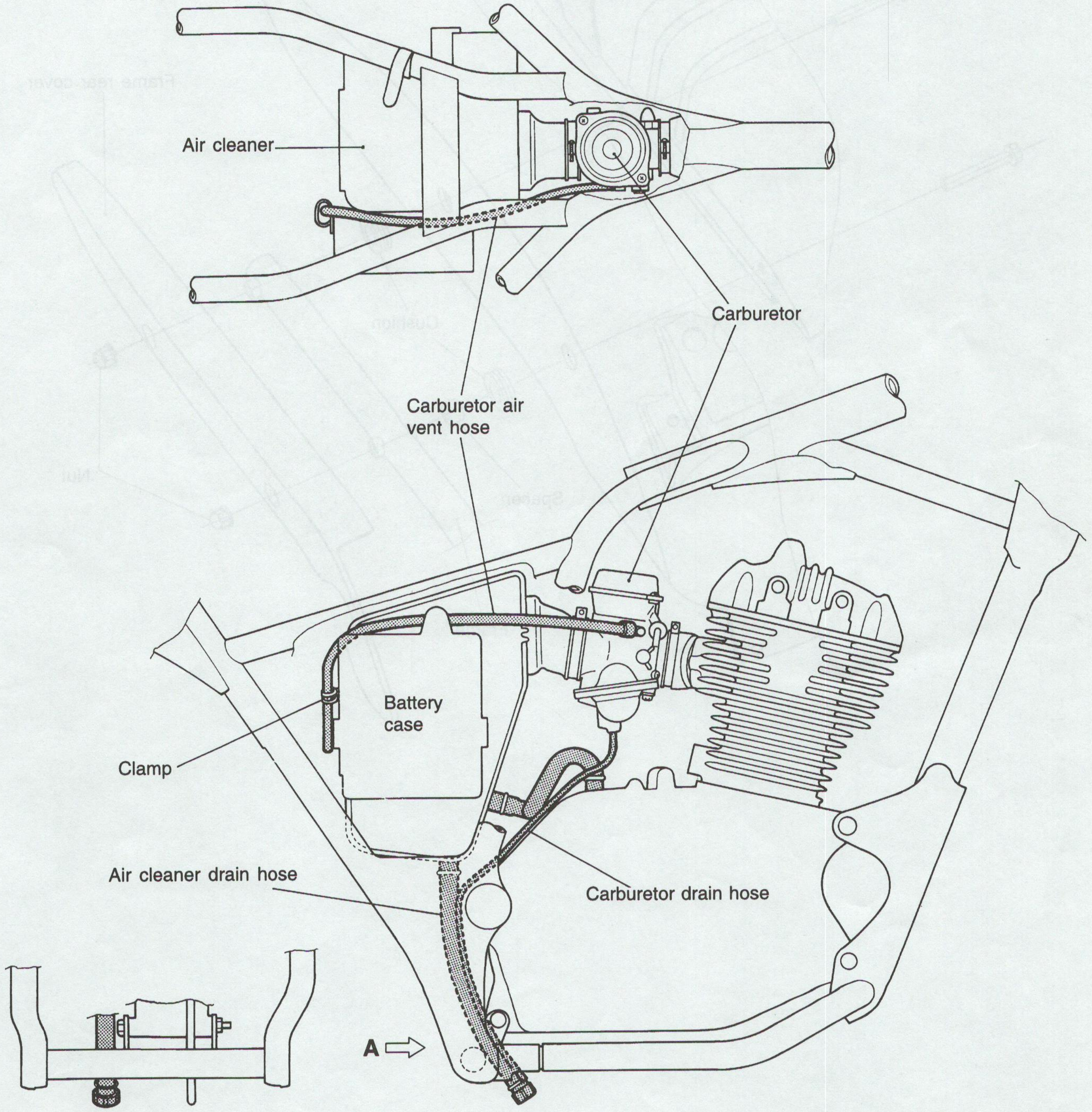
FRONT BRAKE HOSE ROUTING


Master cylinder
15°
42°
Master cylinder
Clamp
(Clamp the brake hose securely.)
Brake hose
Brake hose
Throttle cable
Handlebar switch (R)
Clamp
Brake hose
Clamp
Speedometer cable
Clamp
(Clamp the brake hose securely.)
Brake caliper
After touching the brake hose union to the stopper, tighten the union bolt to the specified torque.
Stopper

CARBURETOR HOSE ROUTING

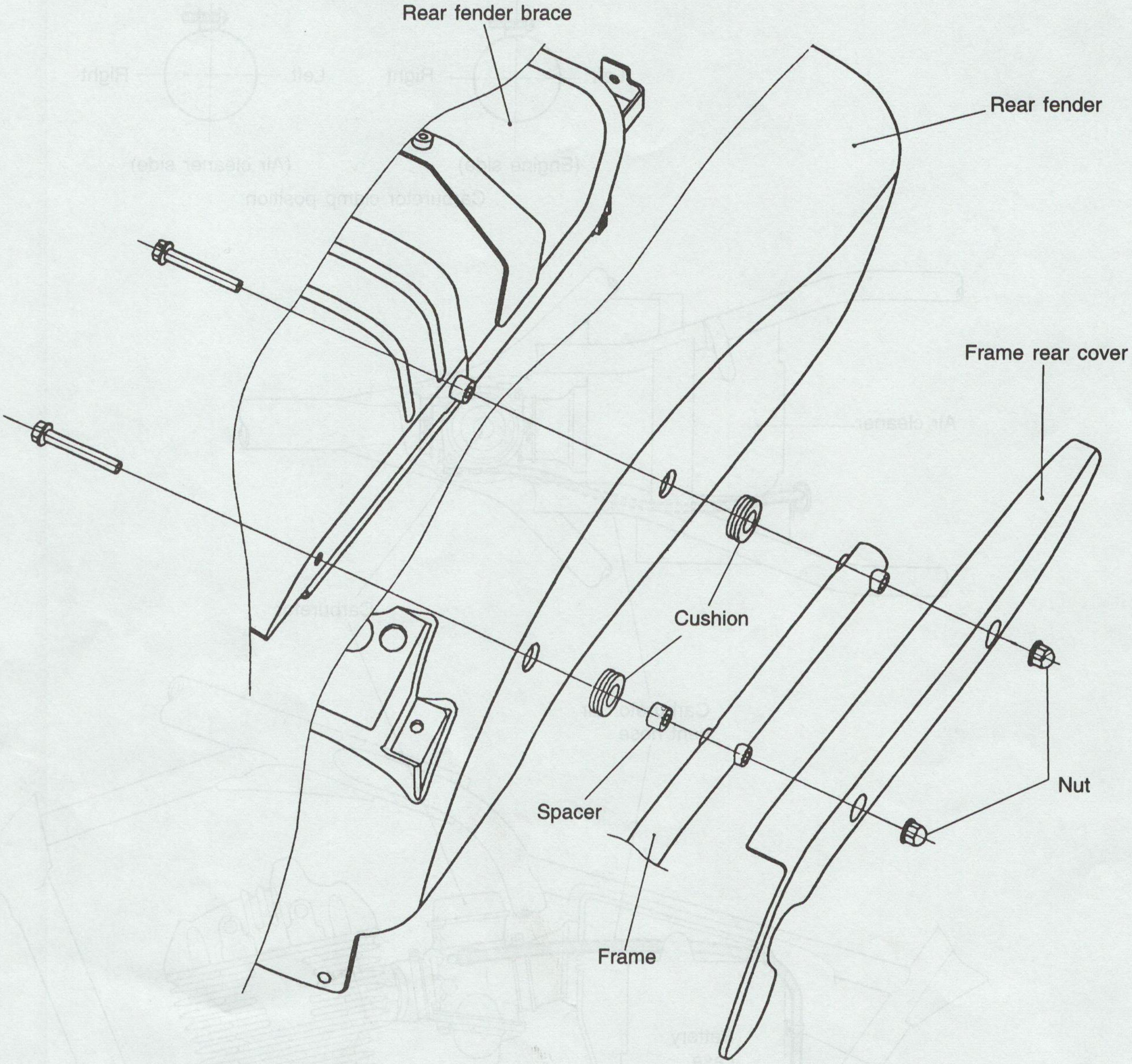

Left
Right
Left
Right
(Engine side)
(Air cleaner side)

Carburetor clamp position

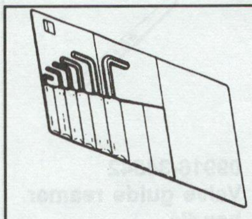
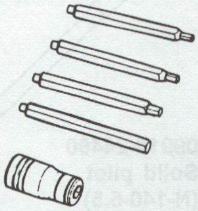
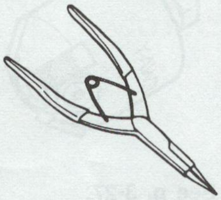
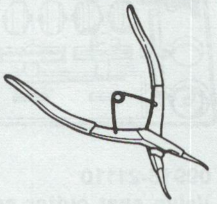
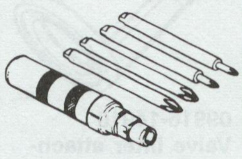
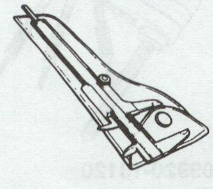
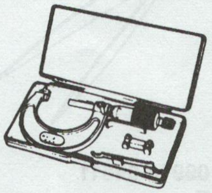
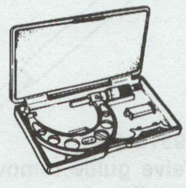
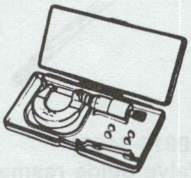
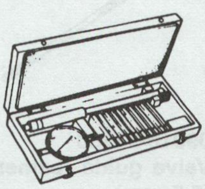
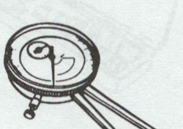
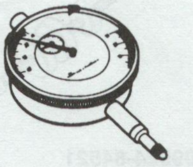
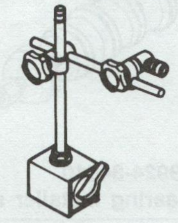
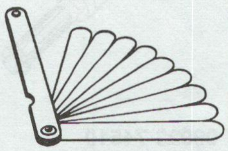
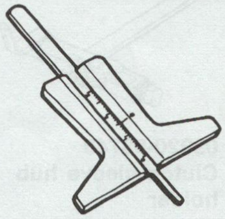
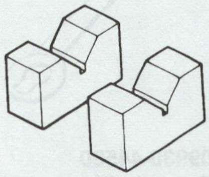
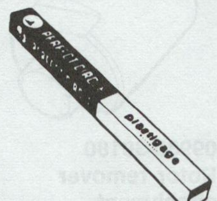
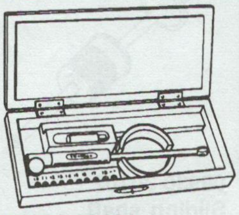
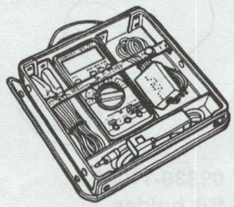
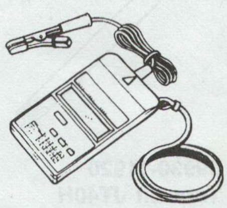
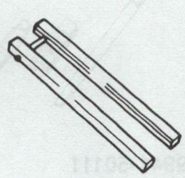
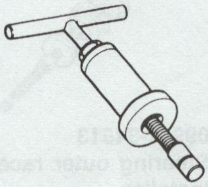
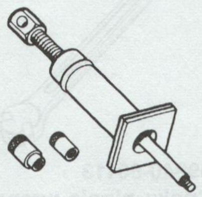
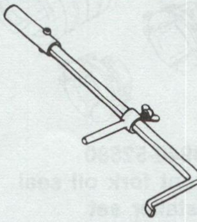
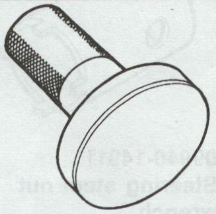
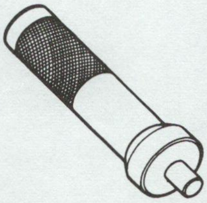
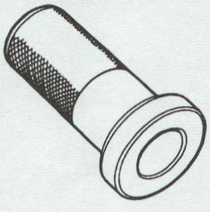
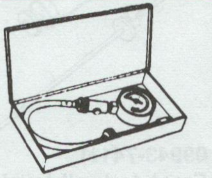
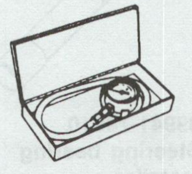
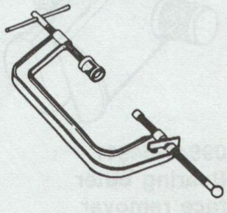

Air cleaner
Carburetor
Carburetor air vent hose
Battery case
Clamp
Air cleaner drain hose
Carburetor drain hose
A

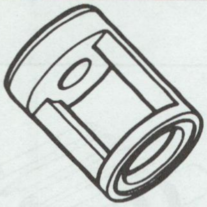
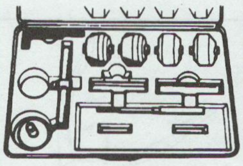
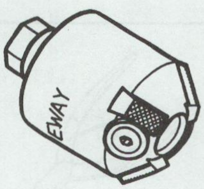
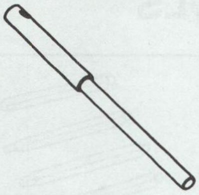
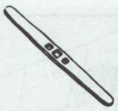
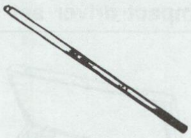
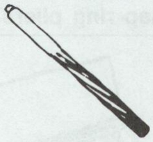
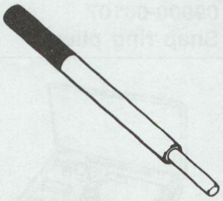
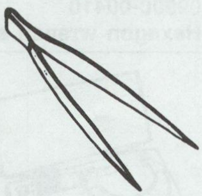
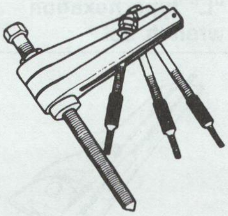
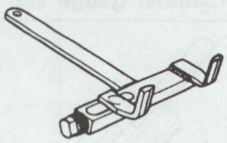
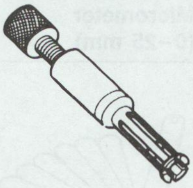
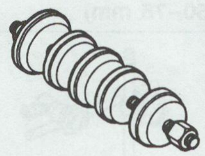
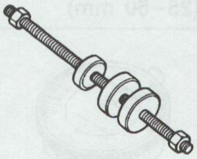
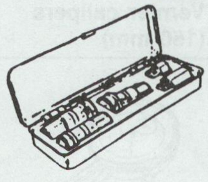
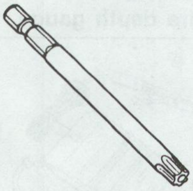
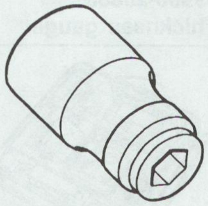
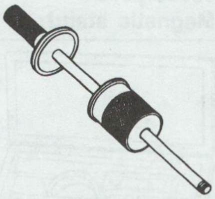
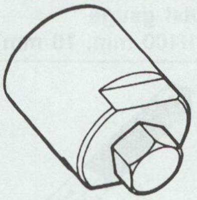
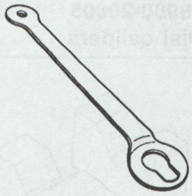
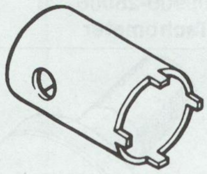
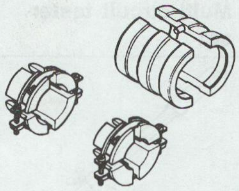
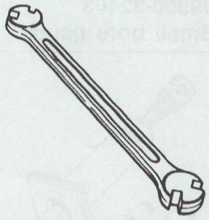
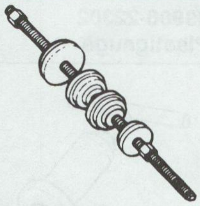
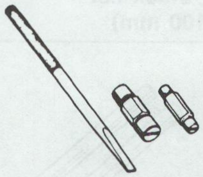
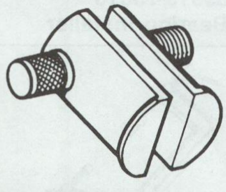
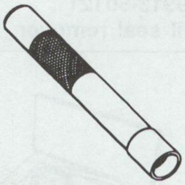
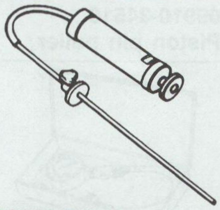
VIEW A

FRAME REAR COVER SET-UP


Rear fender brace
Rear fender
Frame rear cover
Cushion
Nut
Spacer
Frame

SPECIAL TOOLS

 **09900-00401** **"L" type hexagon wrench set**	 **09900-00410** **Hexagon wrench set**	 **09900-06107** **Snap ring pliers**	 **09900-06108** **Snap ring pliers**	 **09900-09004** **Impact driver set**
 **09900-20101** **Vernier calipers (150 mm)**	 **09900-20202** **Micrometer (25–50 mm)**	 **09900-20203** **Micrometer (50–75 mm)**	 **09900-20205** **Micrometer (0–25 mm)**	 **09900-20508** **Cylinder gauge set**
 **09900-20605** **Dial calipers**	 **09900-20606** **Dial gauge (1/100 mm, 10 mm)**	 **09900-20701** **Magnetic stand**	 **09900-20803** **Thickness gauge**	 **09900-20805** **Tire depth gauge**
 **09900-21304** **V-block set (100 mm)**	 **09900-22301** **09900-22302** **Plastigauge**	 **09900-22401** **09900-22403** **Small bore gauge**	 **09900-25008** **Multi circuit tester set**	 **09900-26006** **Tachometer**
 **09910-20116** **Conrod holder**	 **09910-32812** **Crankshaft installer**	 **09910-34510** **Piston pin puller**	 **09913-50121** **Oil seal remover**	 **09913-75510** **Bearing installer**
 **09913-75821** **Bearing installer**	 **09913-76010** **Bearing installer**	 **09915-64510** **Compression gauge** **09915-63210** **(Adaptor)**	 **09915-74510** **Oil pressure gauge**	 **09916-14510** **Valve lifter**

 **09916-14910** **Valve lifter attachment**	 **09916-21110** **Valve seat cutter set**	 **See p. 3-27.**	 **09916-24480** **Solid pilot** **(N-140-5.5)**	 **09916-34542** **Valve guide reamer handle**
 **09916-34550** **Valve guide reamer** **(5.5 mm)**	 **09916-34561** **Valve guide reamer** **(11.3 mm)**	 **09916-44910** **Valve guide remover/ installer**	 **09916-84511** **Tweezers**	 **09920-13120** **Crankcase separator**
 **09920-53740** **Clutch sleeve hub holder**	 **09923-74510** **Bearing remover**	 **09924-84510** **Bearing installer set**	 **09924-84521** **Bearing installer set**	 **09930-10121** **Spark plug socket wrench set**
 **09930-11920** **Torx bit JT40H**	 **09930-11940** **Bit holder**	 **09930-30102** **Sliding shaft**	 **09930-30180** **Rotor remover attachment**	 **09930-44530** **Rotor holder**
 **09940-14911** **Steering stem nut wrench**	 **09940-52880** **Front fork oil seal installer set**	 **09940-60113** **Spoke nipple wrench**	 **09941-34513** **Steering outer race installer**	 **09941-50111** **Bearing remover**
 **09941-54911** **Bearing outer race remover**	 **09941-74910** **Steering bearing installer**	 **09943-74111** **Front fork oil level gauge**		

NOTE:
When ordering a special tool, please confirm whether it is available or not.

TIGHTENING TORQUE

ENGINE

ITEM		N·m	kg-m	lb-ft
Cylinder head cover bolt		10	1.0	7.0
Cylinder head nut	M: 8 mm	27	2.7	19.5
	M: 6 mm	10	1.0	7.0
Camshaft sprocket bolt		11	1.1	8.0
Valve clearance adjuster lock nut		14	1.4	10.0
Rocker arm shaft bolt		9	0.9	6.5
Cam chain tensioner adjuster bolt		7	0.7	5.0
Cylinder base nut		10	1.0	7.0
Generator rotor nut		55	5.5	40.0
Primary drive gear/oil pump drive gear nut		50	5.0	36.0
Clutch sleeve hub nut		40	4.0	29.0
Gearshift arm stopper bolt		19	1.9	13.5
Engine oil drain plug		28	2.8	20.0
Engine sprocket nut		90	9.0	65.0
Engine mounting nut		41	4.1	29.5
Exhaust pipe bolt		11	1.1	8.0
Muffler mounting bolt		11	1.1	8.0
Starter clutch bolt		10	1.0	7.0

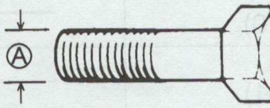
CHASSIS

ITEM	N·m	kg-m	lb-ft
Handlebar clamp bolt	16	1.6	11.5
Handlebar holder nut	45	4.5	32.5
Steering stem head bolt	65	6.5	47.0
Front fork upper clamp bolt	23	2.3	16.5
Front fork lower clamp bolt	33	3.3	24.0
Front fork cap bolt	23	2.3	16.5
Front fork damper rod bolt	20	2.0	14.5
Front axle	65	6.5	47.0
Front axle pinch bolt	23	2.3	16.5
Front brake caliper mounting bolt	39	3.9	28.0
Front brake pad mounting bolt	18	1.8	13.0
Front brake hose union bolt	23	2.3	16.5
Front brake caliper air bleeder valve	7.5	0.75	5.5
Front brake master cylinder mounting bolt	10	1.0	7.0
Front brake disc bolt	23	2.3	16.5
Front footrest bolt	26	2.6	19.0
Swingarm pivot nut	72	7.2	52.0
Rear axle nut	78	7.8	56.5
Rear torque link nut (front and rear)	13	1.3	9.5
Rear shock absorber mounting bolt or nut	29	2.9	21.0
Rear sprocket nut	50	5.0	36.0
Rear brake cam lever nut	10	1.0	7.0
Spoke nipple	4.5	0.45	3.5

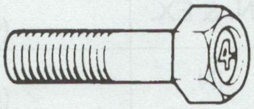
TIGHTENING TORQUE CHART

For other bolts and nuts listed previously, refer to this chart:

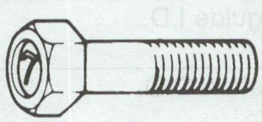
Bolt Diameter Ⓐ (mm)	Conventional or "4" marked bolt			"7" marked bolt		
	N·m	kg-m	lb-ft	N·m	kg-m	lb-ft
4	1.5	0.15	1.0	2	0.2	1.5
5	3	0.3	2.0	5	0.5	3.5
6	6	0.6	4.5	10	1.0	7.0
8	13	1.3	9.5	23	2.3	16.5
10	29	2.9	21.0	50	5.0	36.0
12	45	4.5	32.5	85	8.5	61.5
14	65	6.5	47.0	135	13.5	97.5
16	105	10.5	76.0	210	21.0	152.0
18	160	16.0	115.5	240	24.0	173.5



Conventional bolt



"4" marked bolt



"7" marked bolt

SERVICE DATA

VALVE + GUIDE

Unit: mm (in)

ITEM			STANDARD	LIMIT
Valve diam.	IN.		30 (1.2)	——
	EX.		26 (1.0)	——
Valve clearance (when cold)	IN.		0.08–0.13 (0.003–0.005)	——
	EX.		0.13–0.18 (0.005–0.007)	——
Valve guide to valve stem clearance	IN.		0.010–0.037 (0.0004–0.0015)	——
	EX.		0.030–0.057 (0.0012–0.0022)	——
Valve stem deflection	IN. & EX.		——	0.35 (0.014)
Valve guide I.D.	IN. & EX.		5.500–5.512 (0.2165–0.2170)	——
Valve stem O.D.	IN.		5.475–5.490 (0.2156–0.2161)	——
	EX.		5.455–5.470 (0.2148–0.2154)	——
Valve stem runout	IN. & EX.		——	0.05 (0.002)
Valve head thickness	IN. & EX.		——	0.5 (0.02)
Valve stem end length	IN. & EX.		——	2.5 (0.10)
Valve seat width	IN. & EX.		0.9–1.1 (0.035–0.043)	——
Valve head radial runout	IN. & EX.		——	0.03 (0.001)
Valve spring free length	IN.	INNER	——	35.1 (1.38)
		OUTER	——	39.9 (1.57)
	EX.	INNER	——	36.0 (1.42)
		OUTER	——	39.3 (1.55)
Valve spring tension	IN.	INNER	7.1–9.2 kg (15.65–20.28 lbs) at length 32.5 mm (1.28 in)	——
		OUTER	17.3–21.3 kg (38.14–46.96 lbs) at length 36.0 mm (1.42 in)	——
	EX.	INNER	7.8–9.2 kg (17.20–20.28 lbs) at length 32.5 mm (1.28 in)	——
		OUTER	18.9–22.3 kg (41.67–49.16 lbs) at length 36.0 mm (1.42 in)	——

CAMSHAFT + CYLINDER HEAD

Unit: mm (in)

ITEM	STANDARD		LIMIT
Cam height	IN.	33.120–33.160 (1.3039–1.3055)	32.820 (1.2921)
	EX.	33.120–33.160 (1.3039–1.3055)	32.820 (1.2921)
Camshaft journal oil clearance	IN. & EX.	0.032–0.066 (0.0013–0.0026)	0.150 (0.0059)
Camshaft journal holder I.D.	IN. & EX.	22.012–22.025 (0.8666–0.8671)	———
Camshaft journal O.D.	IN. & EX.	21.959–21.980 (0.8645–0.8654)	———
Camshaft runout	IN. & EX.	———	0.10 (0.004)
Rocker arm I.D.	IN. & EX.	12.000–12.018 (0.4724–0.4731)	———
Rocker arm shaft O.D.	IN. & EX.	11.977–11.995 (0.4715–0.4722)	———
Cylinder head distortion	———		0.05 (0.002)
Cylinder head cover distortion	———		0.05 (0.002)

CYLINDER + PISTON + PISTON RING

Unit: mm (in)

ITEM	STANDARD			LIMIT
Compression pressure			1 000–1 500 kPa (10.0–15.0 kg/cm^2 142–213 psi)	800 kPa (8 kg/cm^2 114 psi)
Piston to cylinder clearance			0.020–0.030 (0.0008–0.0012)	0.120 (0.0047)
Cylinder bore			57.000–57.015 (2.2441–2.2447)	57.110 (2.2484)
Piston diam.			56.975–56.990 (2.2431–2.2437) Measure at 12 mm (0.5 in) from the skirt end.	56.880 (2.2394)
Cylinder distortion			———	0.05 (0.002)
Piston ring free end gap	1st	R	Approx. 7.0 (0.28)	5.6 (0.22)
	2nd	R	Approx. 8.5 (0.33)	6.8 (0.27)
Piston ring end gap	1st		0.10–0.25 (0.004–0.010)	0.50 (0.020)
	2nd		0.10–0.25 (0.004–0.010)	0.50 (0.020)
Piston ring to groove clearance	1st		———	0.180 (0.0071)
	2nd		———	0.150 (0.0059)

ITEM		STANDARD	LIMIT
Piston ring groove width	1st	1.21–1.23 (0.047–0.048)	———
	2nd	1.21–1.23 (0.047–0.048)	———
	Oil	2.51–2.53 (0.099–0.100)	———
Piston ring thickness	1st	1.175–1.190 (0.0463–0.0469)	———
	2nd	1.170–1.190 (0.0461–0.0469)	———
Piston pin bore		14.002–14.008 (0.5513–0.5515)	14.030 (0.5524)
Piston pin O.D.		13.994–14.002 (0.5509–0.5513)	13.982 (0.5505)

CONROD + CRANKSHAFT

Unit: mm (in)

ITEM		STANDARD	LIMIT
Conrod small end I.D.		14.004–14.012 (0.5513–0.5517)	14.040 (0.5528)
Conrod deflection		———	3.0 (0.12)
Conrod big end side clearance		0.10–0.45 (0.004–0.018)	1.0 (0.04)
Conrod big end width		15.95–16.00 (0.628–0.630)	———
Crankshaft web to web width		53.0 ± 0.1 (2.087 ± 0.004)	———
Crankshaft runout		———	0.08 (0.003)

OIL PUMP

ITEM		STANDARD	LIMIT
Oil pump reduction ratio		2.000 (30/15)	———
Oil pressure (at 60°C, 140°F)		Above 10 kPa (0.1 kg/cm^2, 1.42 psi) Below 30 kPa (0.3 kg/cm^2, 4.27 psi) at 3 000 r/min.	———

CLUTCH

Unit: mm (in)

ITEM		STANDARD	LIMIT
Clutch cable play		10–15 (0.4–0.6)	———
Clutch release screw		$^{1}/_{8}$–$^{1}/_{4}$ turn back	———
Drive plate thickness		2.9–3.1 (0.11–0.12)	2.6 (0.10)
Drive plate claw width		11.8–12.0 (0.46–0.47)	11.0 (0.43)
Driven plate distortion		———	0.10 (0.004)
Clutch spring free length		———	29.5 (1.16)

TRANSMISSION + DRIVE CHAIN

Unit: mm (in) Except ratio

ITEM		STANDARD	LIMIT
Primary reduction ratio		3.470 (59/17)	———
Final reduction ratio		3.000 (45/15)	———
Gear ratios	Low	3.000 (33/11)	———
	2nd	1.857 (26/14)	———
	3rd	1.368 (26/19)	———
	4th	1.095 (23/21)	———
	Top	0.913 (21/23)	———
Shift fork to groove clearance		0.10–0.30 (0.004–0.012)	0.50 (0.020)
Shift fork groove width	No.1, No.2	5.0–5.1 (0.197–0.201)	———
	No.3	5.5–5.6 (0.217–0.220)	———
Shift fork thickness	No.1, No.2	4.8–4.9 (0.189–0.193)	———
	No.3	5.3–5.4 (0.209–0.213)	———
Countershaft length (Low to 2nd)		$88.0^{+0}_{-0.2}$ ($3.465^{+0}_{-0.008}$)	———
Drive chain	Type	RK428FDZ	———
	Links	132	———
	20-pitch length	———	259.0 (10.20)
Drive chain slack		5–15 (0.2–0.6)	———

CARBURETOR

ITEM		SPECIFICATION		
		E-02, 04, 25, 34	E-17, 22	E-22 (U-type)
Carburetor type		MIKUNI BS26SS	←	←
Bore size		26 mm	←	←
I.D. No		12F0	12F2	12F3
Idle r/min.		1 500 ± 100 r/min.	←	←
Float height		17.1 ± 0.5 mm	←	←
Main jet	(M.J.)	#110	←	←
Jet needle	(J.N.)	5D97-54-4th	←	←
Needle jet	(N.J.)	P-0	←	←
Pilot jet	(P.J.)	#12.5	←	#15
Throttle valve	(Th.V.)	#105	#100	←
Pilot screw	(P.S.)	$1^5/_8$ turns out	$2^1/_4$ turns out	$1^1/_8$ turns out
Throttle cable play		3–6 mm (0.12–0.24 in)	←	←
Starter plunger cable play		0.5–1.0 mm (0.02–0.04 in)	←	←

CARBURETOR

ITEM		SPECIFICATION	
		E-18	E-01
Carburetor type		MIKUNI BS26SS	←
Bore size		26 mm	←
I.D. No		12F4	12F1
Idle r/min.		1 500 ± 50 r/min.	1 500 ± 100 r/min.
Float height		17.1 ± 0.5 mm	←
Main jet	(M.J.)	#110	←
Jet needle	(J.N.)	6D1-54-3rd	5D97-54-4th
Needle jet	(N.J.)	O-9	P-0
Pilot jet	(P.J.)	#12.5	←
Throttle valve	(Th.V.)	#110	#105
Pilot screw	(P.S.)	$1^{1}/_{2}$ turns out	$1^{5}/_{8}$ turns out
Throttle cable play		3–6 mm (0.12–0.24 in)	←
Starter plunger cable play		0.5–1.0 mm (0.02–0.04 in)	←

ELECTRICAL

Unit: mm (in)

ITEM		SPECIFICATION	NOTE
Ignition timing		13° B.T.D.C. at 1 500 r/min.	
Spark plug	Type	NGK: DR8EA DENSO: X24ESR-U	
	Gap	0.6–0.7 (0.024–0.028)	
Spark performance		Over 8 (0.3) at 1 atm.	
Ignition coil resistance	Primary	3–5 Ω	⊖ terminal–⊕ terminal
	Secondary	17–28 kΩ	⊕ terminal–Plug cap
Ignition coil primary peak voltage		More than 200 V	
Generator coil resistance	Pick-up	150–300 Ω	Bl–G
	Charging	0.3–1.5 Ω	Y–Y
Pick-up coil peak voltage		More than 4.0 V	
Generator Max. output		210 W at 5 000 r/min.	
Generator no-load voltage		More than 45 V (AC) at 5 000 r/min.	
Regulated voltage		13.5–15.0 V at 5 000 r/min.	
Starter relay resistance		3–6 Ω	
Battery	Type designation	FTX7L-BS	
	Capacity	12V 21.6 kC (6 Ah)/10HR	
	Standard electrolyte S.G.	1.320 at 20°C (68°F)	
Fuse size		20A	

WATTAGE

Unit: W

ITEM		SPECIFICATION
Headlight	HI	60
	LO	55
Position light		4
Brake light/Taillight		21/5
Turn signal light		21
Speedometer light		1.7
Neutral indicator light		3.4
Turn signal indicator light		3.4
High beam indicator light		1.7

BRAKE + WHEEL

Unit: mm (in)

ITEM		STANDARD	LIMIT
Rear brake pedal free travel		20–30 (0.8–1.2)	——
Rear brake pedal height		50 (2.0)	——
Brake disc thickness	Front	5.0 ± 0.2 (0.20 ± 0.01)	4.5 (0.18)
Brake disc runout	Front	——	0.30 (0.012)
Master cylinder bore		12.700–12.743 (0.4999–0.5017)	——
Master cylinder piston diam.		12.657–12.684 (0.4983–0.4994)	——
Brake caliper cylinder bore		33.960–34.036 (1.3370–1.3400)	——
Brake caliper piston diam.		33.884–33.934 (1.3340–1.3360)	——
Brake drum I.D.	Rear	——	130.7 (5.15)
Brake lining thickness	Rear	——	1.5 (0.06)
Wheel rim runout	Axial	——	2.0 (0.08)
	Radial	——	2.0 (0.08)
Wheel axle runout	Front	——	0.25 (0.010)
	Rear	——	0.25 (0.010)
Wheel rim size	Front	16 × MT2.50	——
	Rear	15 × MT3.00	——
Tire size	Front	110/90-16 59P	——
	Rear	130/90-15M/C 66P	——
Tire tread depth	Front	——	1.6 (0.06)
	Rear	——	1.6 (0.06)

SUSPENSION

Unit: mm (in)

ITEM	STANDARD	LIMIT	NOTE
Front fork stroke	120 (4.7)	———	
Front fork spring free length	———	301 (11.9)	
Front fork oil level	105 (4.1)	———	
Rear wheel travel	90 (3.5)	———	
Swingarm pivot shaft runout	———	0.3 (0.01)	

TIRE PRESSURE

COLD INFLATION TIRE PRESSURE	NORMAL RIDING					
	SOLO RIDING			DUAL RIDING		
	kPa	kg/cm^2	psi	kPa	kg/cm^2	psi
FRONT	175	1.75	25	175	1.75	25
REAR	200	2.00	29	225	2.25	33

FUEL + OIL

ITEM		SPECIFICATION		NOTE
Fuel type		Gasoline used should be graded 85−95 octane or higher. An unleaded gasoline is recommended.		
Fuel tank including	reserve	14 L (3.7/3.1 US/Imp gal)		
	reserve	2.9 L (0.8/0.6 US/Imp gal)		
Engine oil type and grade		SAE 10W/40, API SF or SG		
Engine oil capacity		Change	850 ml (0.90/0.75 US/Imp qt)	
		Filter change	950 ml (1.00/0.84 US/Imp qt)	
		Overhaul	1 300 ml (1.37/1.14 US/Imp qt)	
Front fork oil type		SUZUKI fork oil SS-08 (#10)		
Front fork oil capacity (each leg)		369 ml (12.5/13.0 US/Imp oz)		
Brake fluid type		DOT 4		

Prepared by

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